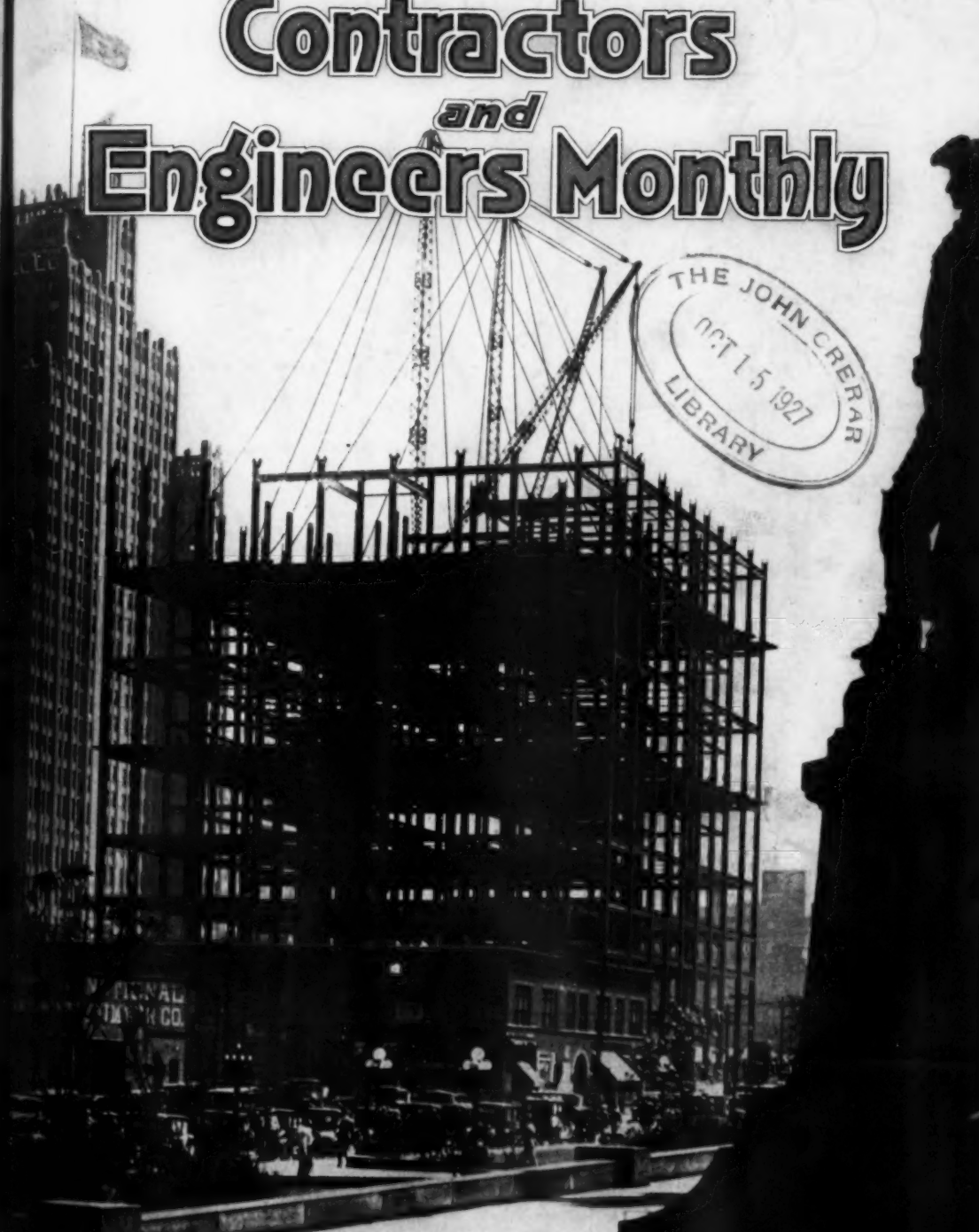


OCTOBER, 1927

62 25 Cents \$1 a Year

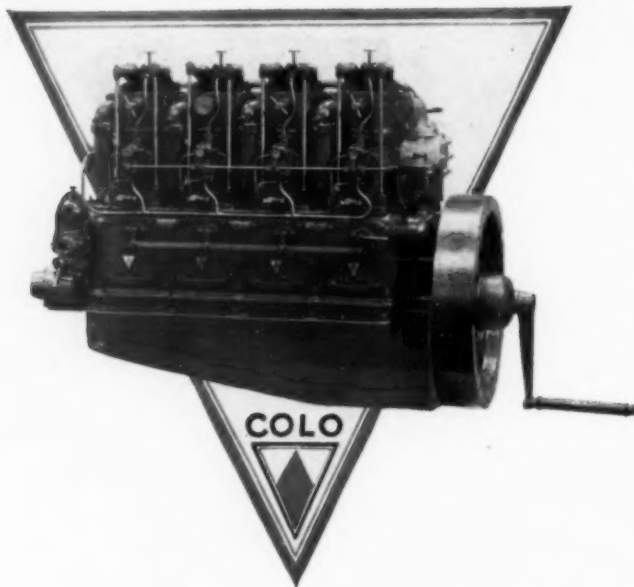
# Contractors *and* Engineers Monthly

A large black and white photograph of a building under construction. The building is a multi-story structure with a complex steel framework. Scaffolding and support beams are visible. In the background, other city buildings and a flag are visible. The foreground shows a street with cars and a low wall.

Structural Steel Work  
of Civil Courts Building,  
St. Louis, Mo.

See page 72

# COLO-DIESEL



## for Mobile Equipment and Stationary Use

**T**HE Colo-Diesel is ideal for installation in Shovels, Drag Lines, Tractors, Road-Building Machinery, etc. For instance, the four-cylinder engine, including flywheel, silencer, and fuel tank, weighs only 1,800 lbs., corresponding to 45 lbs. per b.hp. for the complete installation.

The Colo-Diesel will fit most Mobile Equipment without altering the existing foundations. Built in units from 1 to 6 cylinders of one-cylinder size, the Colo-Diesel is just what is needed to cut down the operating costs and increase the operating efficiency of Mobile Equipment. Write or wire for full details.

### F. VAN ROSSEN HOOGENDYK

*Sole U. S. A. Distributor*

Graybar Building

New York City

AERIAL

\*Amer.  
Brode  
Haza  
A. Le

AIR CO

\*Amer.  
Gre  
\*Buhl  
\*Ceme  
\*Cook  
\*Deme  
bus

\*Gard

\*Novo

\*O. K.

\*Stave

\*Sully

Allis-

Barn

Chien

Carti

De L

Fairi

Gene

Hard

Inde

Inge

Nord

Norw

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West

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AIR CO

\*Dom

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Gene

West

E.

AETE

\*Star

Am.

Inge

AETE

\*Phil

Kea

Mik

Nor

to

Sall

ASH I

\*Cha



# Where to Purchase

A comprehensive classification of the leading machinery and supply manufacturers arranged for the convenience of contractors, engineers and public officials who may wish to secure information about construction equipment. The Index to Advertisers faces the inside back cover. When writing to advertisers please mention the **CONTRACTORS' & ENGINEERS' MONTHLY**. A star (\*) before the manufacturer's name indicates that his advertisement appears in this issue.

This index is published as an aid to the reader, but the publishers assume no responsibility for errors or omissions.

## AERIAL WIRE ROPE TRAMWAYS

\*Amer. Steel & Wire Co., Chicago  
Broderick & Bascom Rope Co., St. Louis  
Hazard Mfg. Co., Wilkesbarre, Pa.  
A. Leschen & Sons Rope Co., St. Louis

## AIR COMPRESSORS

\*American Steam Pump Co., Battle Creek, Mich.  
\*Buhl Co., Chicago  
\*Cement-Gun Co., Allentown, Pa.  
\*Cook Motor Co., Delaware, O.  
\*Domestic Eng. & Pump Co., Shippensburg, Pa.  
\*Gardner-Denver Co., Denver, Col.  
\*Nove Engine Co., Lansing, Mich.  
\*O. K. Clutch & Mach. Co., Columbia, Pa.  
\*Stover Mfg. & Eng. Co., Freeport, Ill.  
\*Sullivan Mch. Co., Chicago  
Allis-Chalmers Mfg. Co., Milwaukee.  
Barnes Mfg. Co., Mansfield, O.  
Chicago Pneumatic Tool Co., N. Y.  
Curtis Pn. Mch. Co., St. Louis, Mo.  
De Laval Stm. Turb. Co., Trenton, N. J.  
Fairbanks, Morse & Co., Chicago.  
General Elec. Co., Schenectady, N. Y.  
Hardie-Tyres Mfg. Co., Birmingham, Ala.  
Independent Pneum. Tool Co., Chicago.  
Indiana Air Pump Co., Ind'polis, Ind.  
Ingersoll-Rand Co., N. Y.  
Nordberg Mfg. Co., Milwaukee.  
Norwalk Ir. Wks. Co., So. Norwalk, Ct.  
Schramm, Inc., West Chester, Pa.  
United Iron Wks., Kans. City, Mo.  
Westinghouse Trac. Brake Co., Wl. merding, Pa.  
Worthington Pump & Mch. Corp., N.Y.

## AIR COMPRESSORS, PORTABLE

\*Domestic Engine & Pump Co., Shippensburg, Pa.  
Ingersoll-Rand Co., N. Y.

## ARC LAMPS

General Elec. Co., Schenectady, N. Y.  
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

## ARTESIAN WELL DRILLS & PUMPS

\*Star Drilling Mach. Co., Akron, O.  
Am. Well Works, Aurora, Ill.  
Ingersoll-Rand Co., New York.

## ASBESTOS PRODUCTS

\*Phillip Carey Co., Cincinnati.  
Keesbey & Mattison Co., Ambler, Pa.  
Mikessell Bros. Co., Wabash, Ind.  
Norristown Mag. & Asb. Co., Norristown, Pa.  
Sall Mountain Co., Chicago.

## ASH HANDLING MACHINERY

\*Chain Belt Co., Milwaukee.

\*Chicago Automatic Conv. Co., Chicago.

\*Erie Steam Shovel Co., Erie, Pa.

\*Geo. Hais Mfg. Co., N. Y.

\*Mack Trucks, Inc., N. Y.

\*Lakewood Eng. Co., Cleveland, O.

\*Link-Belt Co., Chicago

\*Mead-Morrison Mfg. Co., E. Boston, Mass.

\*Ortón Crane & Shovel Co., Chicago.

Atia-Corp., New York.

C. O. Bartlett & Snow Co., Cleveland, O.

Brown Hoisting Mach. Co., Cleveland, O.

Byers Mach. Co., Ravenna, O.

Gifford-Wood Co., Hudson, N. Y.

Green Eng. Co., E. Chicago, Ind.

Jeffrey Mfg. Co., Columbus, O.

Portable Mach. Co., Clifton, N. J.

Robins Conv. Belt Co., N. Y.

Jas. B. Seaverns Co., Batavia, Ill.

Webster Mfg. Co., Chicago.

Weller Mfg. Co., Chicago.

## ASPHALT

\*Barber Asphalt Co., Philadelphia.

\*Barrett Co., N. Y.

\*Standard Oil Co. (Ind.), Chicago.

\*Standard Oil Co. (N. Y.), N. Y.

\*Warren Bros. Co., Boston.

Atlantic Ref. & Asph. Corp., Phila.

Gulf Refining Co., Pittsburgh.

Ky. Rock Asph. Co., Louisville, Ky.

Natural Rk. Asph. Corp., Owensboro, Ky.

New Orleans Ref. Co., New Orleans.

Pioneer Asph. Co., Lawrenceville, Ill.

Sinclair Ref. Co., Chicago.

Standard Oil Co. of Cal., S. Francisco.

Standard Oil Co. of La., N. Orleans.

Standard Oil Co. of N. J., Newark.

Texas Co., N. Y.

## ASPHALT BLOCK

Hastings Pavement Co., N. Y.

## ASPHALT BRICK

Asphalt Brick Co., St. Louis.

## ASPHALT CUTTERS

\*Gardner-Denver Co., Denver, Col.

\*Littleford Bros., Cincinnati.

\*Sullivan Machinery Co., Chicago.

Chicago Pneumatic Tool Co., N. Y.

Cleveland Rock Drill Co., Cleveland, O.

Dayton Pneum. Tool Co., Dayton, O.

Independent Pn. Tool Co., Chicago, Ill.

Ingersoll-Rand Co., N. Y.

## ASPHALT KETTLES (See Kettles for Asphalt and Tar Heating)

## ASPHALT PLANTS, TOOLS, ETC.

\*Aeroli Burner Co., West New York, N.J.

\*Barber Asphalt Co., Philadelphia.

\*Littleford Bros., Cincinnati, O.

\*Warren Bros. Co., Boston.

American Fin-Mix Co., Chicago, Ill.

Chausse Oil Burner Co., Elkhart, Ind.

F. D. Cummer & Son Co., Cleveland, O.

J. D. Farassy Mfg. Co., Cleveland, O.

Hetherington & Berner, Indianapolis.

Hauck Mfg. Co., Bklyn, N. Y.

Merriman Asphalt Plant, Inc., Lima, O.

Mosher Mfg. Co., Chicago, Ill.

## ASPHALT ROLLERS (See Road Rollers)

## ASPHALT SURFACE HEATERS

\*Aeroli Burner Co., West New York, N.J.

\*Barber Asphalt Co., Philadelphia.

Chausse Oil Burner Co., Elkhart, Ind.

Equitable Asp. Maint. Co., Kan. C. Mo.

Good Roads Equip. Corp., Phila.

Hauck Mfg. Co., B'klyn, N. Y.

## BACKFILLERS

\*Baker Mfg. Co., Springfield, Ill.

\*Bay City Dredge Wks., Bay City, Mich.

\*Buckeye Trac. Ditcher Co., Findlay, O.

\*Erie Steam Shovel Co., Erie, Pa.

\*Ernst Mch. Mfg. Co., Portland, Ore.

\*Koehring Co., Milwaukee, Wis.

\*Link-Belt Co., Chicago.

\*Miami Trailer-Scraper Co., Troy, O.

\*Orton Crane & Shovel Co., Chicago.

\*Parsons Co., Newton, Ia.

\*Speeder Mch. Corp., Cedar Rapids, Ia.

\*Star Drilling Mach. Co., Akron, O.

\*Waterman Corp., Detroit.

Austin Mach. Corp., Muskegon, Mich.

Byers Machine Co., Ravenna, O.

Construction Mch. Co., Waterloo, Ia.

Harnischfeger Corp., Milwaukee, Wis.

Lesman Loader Mfg. Co., Des Moines

Weller Mfg. Co., Chicago.

## BAGS

\*Bates Valve Bag Co., Chicago.

## BAR BENDERS AND CUTTERS

\*Koehring Co., Milwaukee, Wis.

\*Ransome Conc. Mch. Co., Dunellen, N.J.

Buffalo Forge Co., Buffalo, N. Y.

Concrete Steel Co., N. Y.

Electric Welding Co., Pittsburgh.

D. A. Hinman & Co., Sandwich, Ill.

J. L. Gleason & Co., Boston, Mass.

McKenna Co., Cleveland, O.

## BAR CHAIRS, REINFORCING

\*Truscon Steel Co., Youngstown, O.

Concrete Steel Co., N. Y.

Universal Form Clamp Co., Chicago.

## BAR TIES

\*Bates Valve Bag Co., Chicago.

## BATCH BOXES

\*Blaw-Knox Co., Pittsburgh, Pa.

\*Heltzel Stl. Form & Ir. Co., Warren, O.

**For Leading Local Distributors of Contractors' Equipment in Each State, See Directory on pages 155 to 191.**

# Where to Purchase

\*Jos. Honhorst Co., Cincinnati  
 \*Lakewood Eng. Co., Cleveland, O.  
 \*Littleford Bros., Cincinnati.  
 Easton Car & Const'n Co., Easton, Pa.  
 Easton Car & Const'n Co. of Mo.,  
 Kansas City, Mo.  
 Erie Steel Const. Co., Erie, Pa.  
 Koppel Ind. Car & Equip. Co., Koppel,  
 Pa.  
 Jas. B. Seaverns Co., Batavia, Ill.  
 Western Wheeled Scraper Co., Aurora,  
 Ill.

## BEARINGS

Fafnir Bearing Co., New Britain, Conn.  
 Hyatt Roller Bear. Co., Harrison, N. J.  
 New Departure Mfg. Co., Bristol, Conn.  
 S. K. F. Industries, New York.  
 Timken Roller Bearing Co., Canton, O.

## BDS, STORAGE

\*Austin-Western Rd. Mach. Co., Chicago.  
 \*Blaw-Knox Co., Pittsburgh, Pa.  
 \*Gallion Iron Wks. & Mfg. Co., Gallion, O.  
 \*Good Roads Mch. Co., Kennett Sq., Pa.  
 \*Heitzel Stl. Form & Ir. Co., Warren, O.  
 \*Link-Belt Co., Chicago.  
 \*Ransome Conc. Mch. Co., Dunellen, N.J.  
 \*Russell Grader Mfg. Co., Minneapolis.  
 Austin Mfg. Co., Chicago.  
 Birmingham Tank Co., Birmingham, Ala.  
 Brown Hoisting Mch. Co., Cleveland.  
 Butler Bin Co., Waukesha, Wis.  
 Canton Art Metal Co., Canton, O.  
 Easton Car & Const. Co., Easton, Pa.  
 Erie Steel Const. Co., Erie, Pa.  
 Fairfield Eng. Co., Marion, O.  
 Pittsburgh-Des Moines Steel Co., Pitts-  
 burgh, Pa.  
 Jas. B. Seaverns Co., Batavia, Ill.  
 Universal Rd. Mach. Co., Kingston, N.Y.  
 Weller Mfg. Co., Chicago.

## BLADES FOR GRADERS & SNOW PLOW

\*Gallion Iron Wks. & Mfg. Co., Gallion, O.  
 \*Russell Grader Mfg. Co., Minneapolis.  
 J. D. Adams & Co., Indianapolis.  
 Shunk Mfg. Co., Bucyrus, O.

## BLAST HOLE DRILLING MACHINES (See Well Drilling and Blast Hole Machines)

## BLASTING ACCESSORIES

E. I. du Pont de Nemours & Co., Wil-  
 mington.  
 Hercules Powder Co., Wilmington.

## BLASTING POWDER (See Explosives)

## BLOCKS AND TACKLE

\*Boston & Lockport Bk. Co., E. Boston,  
 Mass.  
 \*Dobbie Fdry. & Mach. Co., Niagara  
 Falls, N. Y.  
 \*Western Block Co., Lockport, N. Y.

## BLOW TORCHES

\*Everhot Mfg. Co., Maywood, Ill.

## BLUE PRINT MACHINES

Paragon Mach. Co., Rochester, N. Y.  
 C. F. Pease Co., Chicago.  
 Wickes Bros., Saginaw, Mich.

## BODIES; SPECIAL FORD

Anthony Co., Streator, Ill.  
 Standard Comm. Body Corp., B'klyn.

## BOILERS

\*Johnston Bros., Inc., Ferrysburg, Mich.  
 Chandler & Taylor Co., Indianapolis.  
 Chatta. Boiler & Tank Co., Chatta., Tenn.  
 R. D. Cole Mfg. Co., Newnan, Ga.  
 Combustion Eng. Corp., N. Y.  
 Erie City Iron Wks. Erie, Pa.  
 Hartley Br. Wks. Montgomery, Ala.  
 Heine Boiler Co., St. Louis, Mo.  
 E. Keeler Co., Williamsport, Pa.  
 Lead Water Tube Bkr. Co., Pittsburgh, Pa.  
 V. Löffel & Co., Springfield, O.  
 Lord & Burnham Co., Irvington, N. Y.

Murray Iron Wks. Co., Burlington, Ia.  
 Nagle Eng. & Bkr. Wks. Erie, Pa.  
 New Bern Iron Wks. & Sup. Co., New  
 Bern, N. C.  
 Petroleum Iron Wks. Co., Sharon, Pa.  
 J. S. Schofield's Sons Co., Macon, Ga.  
 Stanwood Corp., Cincinnati, O.  
 Superior Body Corp., Marion, Ind.  
 Vogt Mch. Co., Inc., Louisville, Ky.  
 Walsh & Weidner Bkr. Co., Chattanooga,  
 Tenn.

## BRACES, TRENCH

\*Templeton, Kenly & Co., Chicago  
 \*Williams Rail. Form Clamp Co., Ch'go.  
 Jas. H. Channon Mfg. Co., Chicago.  
 Duff Mfg. Co., Pittsburgh, Pa.  
 Kalamazoo Fdry. & Mach. Co., Kala-  
 mazoo, Mich.  
 Waldo Bros. & Bond Co., Boston.

## BRANDING TOOLS

\*Everhot Mfg. Co., Maywood, Ill.

## BRASS GOODS

\*Union Water Meter Co., Worcester, Mass.  
 Glauber Brass. Mfg. Co., Cleveland, O.  
 Haydensville Co., Haydensville, Mass.  
 Hays Mfg. Co., Erie, Pa.  
 Mueller Company, Decatur, Ill.  
 United-Obendorf Corp., Cleveland, O.

## BREAKERS, CONCRETE

\*Buckeye Trac. Ditcher Co., Findlay, O.  
 \*Gardner-Denver Co., Denver, Col.  
 \*Hardsoc Wonder Drill Co., Ottumwa, Ia.  
 \*Sullivan Machy. Co., Chicago  
 Chicago Pneumatic Tool Co., N. Y.  
 Cleveland Rock Drill Co., Cleveland, O.  
 Independent Pa. Tool Co., Chicago.  
 Ingersoll-Rand Co., N. Y.

## BRICK, PAVING (See Paving Brick)

## BRICK CLEANING MACHINES

Elgin Gas Motor Co., Elgin, Ill.  
 Rotor Air Tool Co., Cleveland.

## BRIDGES, CONCRETE

\*Frederick Snare Corp., New York

## BRIDGES AND BUILDINGS, STEEL

\*Blaw-Knox Co., Pittsburgh, Pa.  
 \*Frederick Snare Corporation, N. Y.  
 American Bridge Co., N. Y.  
 Bellefontaine Br. & Stl. Co., Belle-  
 fontaine, O.  
 Belmont Iron Wks., Phila.  
 Berlin Constr. Co., Berlin, Conn.  
 Bethlehem Steel Co., Bethlehem, Pa.  
 Boston Bridge Wks., Boston.  
 Central States Br. Co., Ind'polis, Ind.  
 Champion Bridge Co., Wilmington, O.  
 Chesapeake Ir. Wks., Baltimore, Md.  
 Clinton Bridge Wks., Clinton, Ia.  
 Eastern Bridge & Struc. Co., Worces-  
 ter, Mass.  
 Fort Pitt Orn. Iron Co., Minneapolis.  
 Flour Pitt Br. Wks., Pittsburgh, Pa.  
 Hughes-Keenan Co., Mansfield, O.  
 Ingalls Ir. Wks. Co., Birmingham, Ala.  
 Inter. Stl. & Ir. Co., Evansville, Ind.  
 Lakeside Br. & St. Co., No. Milwaukee.  
 Louisville Br. & Ir. Co., Louisville, Ky.  
 McClintic Marshall Co., Pittsburgh, Pa.  
 Milwaukee Br. Co., Milwaukee, Wis.  
 Minn. Stl. & Mch. Co., Minneapolis.  
 Minnesota Vy. Br. & Ir. Co., Leaven-  
 worth, Kan.  
 Mt. Vernon Br. Co., Mt. Vernon, O.  
 Penn. Bridge Co., Beaver Falls, Pa.  
 Pittsburgh-Des Moines Stl. Co., Pitts-  
 burgh, Pa.  
 Richmond Struc. Stl. Co., Richmond,  
 Va.  
 Riverside Br. Co., Martins Ferry, O.  
 Virginia Br. & Ir. Co., Roanoke, Va.  
 Wise Br. & Ir. Co., No. Milwaukee, Wis.

## BRONZE TABLETS

Flour City Orn. Ir. Co., Minneapolis.  
 Imperial Brass Mfg. Co., Chicago.  
 J. L. Mott Iron Wks., N. Y.

## BROOMS (See Street Sweeping Brooms)

## BUCKETS, AUTOMATIC DUMPING

\*Lakewood Eng. Co., Cleveland, O.  
 \*Union Iron Wks., Inc., Hoboken, N. J.  
 G. L. Steubner Ir. Wks., Inc., Long  
 Island City, N. Y.

## BUCKETS, CLAM SHELL

\*Blaw-Knox Co., Pittsburgh, Pa.  
 \*Geo. Hais Mfg. Co., N. Y.  
 \*J. F. Kiesler Co., Chicago  
 \*Lakewood Eng. Co., Cleveland, O.  
 \*Link-Belt Co., Chicago.  
 \*Mead-Morrison Mfg. Co., E. Boston, Mass.  
 \*Orton Crane & Shovel Co., Chicago.  
 Brown Hoisting Mach. Co., Cleveland, O.  
 Buffalo Hst. & Der. Co., Buffalo, N. Y.  
 Browning Crane Co., Cleveland, O.  
 F. A. Coleman Co., Cleveland, O.  
 Erie Steel Const. Co., Erie, Pa.  
 Hayward Co., N. Y.  
 Industrial Wks., Bay City, Mich.  
 McMyler Interstate Co., Cleveland, O.  
 Owen Bucket Co., Cleveland, O.  
 Page Eng. Co., Chicago  
 G. H. Williams Co., Erie, Pa.

## BUCKETS, CONCRETE

\*Insley Mfg. Co., Indianapolis, Ind.  
 \*Lakewood Eng. Co., Cleveland, O.  
 \*Ransome Conc. Mch. Co., Dunellen,  
 N. J.  
 \*Union Iron Works, Inc., Hoboken, N. J.  
 Koppel Ind. Car & Equip. Co., Koppel, Pa.  
 G. L. Steubner Ir. Wks., Inc., Long  
 Island City, N. Y.

## BUCKETS, DRAGLINE

\*Blaw-Knox Co., Pittsburgh, Pa.  
 \*Dobbie Fdry. & Mch. Co., Niagara  
 Falls, N. Y.  
 \*Gallion Ir. Wks. & Mfg. Co., Gallion, O.  
 \*Link-Belt Co., Chicago.  
 \*Russell Grader Mfg. Co., Minneapolis  
 \*Sauterman Bros., Chicago.  
 Beach Mfg. Co., Charlotte, Mich.  
 R. H. Beaumont Co., Philadelphia  
 Monighan Mach. Co., Chicago.  
 Page Eng. Co., Chicago.  
 Pioneer Bucket Co., Indianapolis, Ind.

## BUCKETS, DREDGING AND EXCA- VATING

\*Blaw-Knox Co., Pittsburgh, Pa.  
 \*Geo. Hais Mfg. Co., N. Y.  
 \*J. F. Kiesler Co., Chicago.  
 \*Lakewood Eng. Co., Cleveland, O.  
 \*Link-Belt Co., Chicago.  
 \*Mead-Morrison Mfg. Co., E. Boston, Mass.  
 \*Orton Crane & Shovel Co., Chicago.  
 Brown Hoisting Mach. Co., Cleveland, O.  
 Browning Crane Co., Cleveland, O.  
 Hayward Co., N. Y.  
 Owen Bucket Co., Cleveland, O.  
 G. H. Williams Co., Erie, Pa.

## BUCKETS, ORANGE PEEL

\*J. F. Kiesler Co., Chicago.  
 \*Link-Belt Co., Chicago.  
 \*Mead-Morrison Mfg. Co., E. Boston, Mass.  
 \*Orton Crane & Shovel Co., Chicago.  
 Hayward Co., N. Y.  
 Industrial Wks., Bay City, Mich.  
 McMyler Interstate Co., Cleveland, O.

## BUILDING FORMS (See Forms, Conc.)

## BUILDING, STEEL (See Bridges)

## BULLDOZERS

\*LaPlant-Chocote Mfg. Co., Cedar Rapids,  
 Iowa

## BUNKS AND COTS

Pitt Bedding Co., Pittsburgh, Pa.  
 Haggard & Marcussen Co., Chicago.  
 Southern Rome Co., Baltimore, Md.

## CABLES (See Wire and Cable)

## CABLEWAYS, DRAGLINE

\*S. Flory Mfg. Co., Bangor, Pa.  
 \*Link-Belt Co., Chicago.  
 \*Mead-Morrison Mfg. Co., E. Boston, Mass.  
 \*Russell Grader Mfg. Co., Minneapolis.  
 \*Sauterman Bros., Chicago.  
 Street Bros. Mach. Wks., Chattanooga.

\* Indicates that the manufacturer carries an advertisement. See index facing inside back cover.\*

# Better Roads and Pavements

Concrete highways are insured against deterioration with a minimum of maintenance costs by Truscon Reinforcing Road Products.

**TRUSCON WELDED STEEL FABRIC** gives more strength than extra thicknesses of concrete. It helps the road to withstand weather stresses and the wear of heavy traffic. Easy to handle and place. Furnished in sheets cut to length or in rolls.

**TRUSCON STEEL ROAD FORMS**—speed up road construction and insure accurate alignment of concrete. They enable the contractor to build better roads at less cost and with more speed.

**TRUSCON DOWEL CONTRACTION JOINTS**—protect the road from irregular cracks caused by expansion and contraction.

**TRUSCON CURB BARS**—give positive protection to exposed concrete corners and edges.

*Write for the Truscon Handbook,  
"Modern Road Construction and  
Field Book"—free on request.*

**TRUSCON STEEL COMPANY**

**YOUNGSTOWN, OHIO**

Established 1903

*Warehouses and Offices in all Principal Cities*

# TRUSCON

**TRUSCON**  
PRODUCTS FOR  
**REINFORCING**  
ROADS AND PAVEMENTS

**WELDED STEEL FABRIC**

**CONTRACTION JOINTS**

**STEEL ROAD FORMS**

**RIB BARS**

**CURB BARS**

**EXPANDED METAL**

Welded Steel Fabric for Permanency  
Contraction Joints . . . . . for Safety  
Steel Road Forms . . . . . for Economy  
Rib Bars . . . . . for Reinforcing  
Curb Bars . . . . . for Protection

Do you mention the CONTRACTORS AND ENGINEERS MONTHLY when writing? Please do.

# Where to Purchase

## CARS FOR MOTOR TRUCKS

Highland Body Mfg. Co., Cincinnati, O.  
Weatherproof Body Corp., Corunna, Mich.

## CAISSONS

American Bridge Co., N. Y.  
Biggs Boiler Wks., Akron, O.  
Birmingham Tank Co., Birmingham, Ala.  
Foundation Co., N. Y.  
Bethlehem Steel Co., Bethlehem, Pa.  
O'Rourke Eng. Constr. Co., N. Y.  
Petroleum Ir. Wks. Co., Sharon, Pa.

## CALCIUM CHLORIDE FOR ROADS

\*Dew Chemical Co., Midland, Mich.  
\*Solvay Sales Corp., New York  
Carbondale Calcium Co., Carbondale, Pa.

## CANS FOR GARBAGE AND REFUSE

American Can Co., N. Y.  
Butler Mfg. Co., Minneapolis.  
Canton Art Metal Co., Canton, O.  
Economy Baler Co., Ann Arbor, Mich.  
Rochester Cast Co., Rochester, N. Y.  
Solar-Sturges Mfg. Co., Melrose Pk., Ill.  
Steel Basket Co., Cedar Rapids, Ia.

## CAR UNLOADERS (See Loaders)

## CARS, INDUSTRIAL V. DUMPING

\*Insley Mfg. Co., Indianapolis, Ind.  
\*Lakewood Eng. Co., Cleveland, O.  
Atlas Car & Mfg. Co., Cleveland, O.  
Austin Mfg. Co., Chicago  
Chase Fdry. & Mfg. Co., Columbus, O.  
Easton Car & Const. Co., Easton, Pa.  
C. W. Hunt Co., W. New Brighton, N. Y.  
Koppel Ind. Car & Equip. Co., Koppel, Pa.  
G. L. Stuebner Ir. Wks., Inc., Long Island City, N. Y.  
United Ir. Wks. Inc., Kans. City, Mo.  
Weller Mfg. Co., Chicago.  
Whiting Corp., Harvey, Ill.

## CARTS, CONCRETE

\*General Wheelbarrow Co., Akron, O.  
\*Insley Mfg. Co., Indianapolis, Ind.  
\*Lakewood Eng. Co., Cleveland, O.  
\*Ransome Conc. Mch. Co., Dunellen, N. J.  
\*Sterling Wheelbarrow Co., Milwaukee  
\*Toledo Wheelbarrow Co., Toledo, O.  
Chattanooga Wheelbarrow Co., Chattanooga, Tenn.  
Cleveland Wheelbarrow Co., Cleveland, O.  
Easton Car & Const. Co., Easton, Pa.  
E. D. Etnyre & Co., Oregon, Ill.  
Gray Iron Fdry. Co., Reading, Pa.  
Jackson Mfg. Co., Harrisburg, Pa.  
Lansing Co., Lansing, Mich.  
Lee Trailer & Body Co., Plymouth, Ind.

## CAST IRON PIPE (See Pipe, Cast Iron)

## CASTINGS, STREET AND SEWER

\*Central Fdry. Co., N. Y.  
\*Gallien Ir. Wks. & Mfg. Co., Gallien, O.  
\*U. S. Cast Ir. Pipe & Fdry. Co., Burlington, N. J.  
Burch Corp., Crestline, O.  
Canton Fdry. & Mach. Co., Canton, O.  
Casey-Hedges Co., Chattanooga, Tenn.  
H. W. Clark Co., Matteson, Ill.  
J. B. Clow & Sons, Chicago.  
W. E. Des Co., Chicago.  
Elkhart Fdry. & Mach. Co., Elkhart, Ind.  
Gilbert Mfg. Co., Aberdeen, S. Dak.  
Klauer Mfg. Co., Dubuque, Ia.  
Madison Fdry. Co., Cleveland, O.  
Pechstein Iron Works, Keokuk, Ia.  
Sessions Foundry Co., Bristol, Conn.  
South Bend Fdry. Co., So. Bend, Ind.

## CATCH BASINS (See Castings, Street)

## CATCH BASIN CLEANING OUTFITS

\*Mack Trucks, Inc., N. Y.  
Atla Corp., N. Y.  
Elgin Sales Corp., N. Y.  
Movakan Co., Indianapolis, Ind.

## CAULKING MACHINERY AND TOOLS

Cleveland Rock Drill Co., Cleveland, O.  
Helwig Mfg. Co., St. Paul, Minn.

Independent Pn. Tool Co., Chicago.  
Ingersoll-Rand Co., N. Y.  
Mueller Company, Decatur, Ill.

## CEILINGS, METAL

Berger Mfg. Co., Canton, O.  
Canton Art Metal Co., Canton, O.  
Globe Iron Roofing & Cor. Co., Cincinnati, O.  
Newport Rolling Mill Co., Newport, Ky.  
Klauer Mfg. Co., Dubuque, Ia.  
Geo. L. Mesker & Co., Evansville, Ind.  
Milwaukee Corr. Co., Milwaukee.  
Republic Ir. & Stl. Co., Youngstown, O.  
Wheeling Corr. Co., Wheeling, W. Va.

## CEMENT (P. C. stands for Portland Cement)

\*Pennsylvania-Dixie Cement Corp., N. Y.  
(Brands: *Pennsylvania, Dexter, Penn-Allen, Royal & Clinchfield P. C.*)  
Acme Cement Corp., Catskill, N. Y.  
Etna P. C. Co., Detroit, Mich.  
Alabama P. C. Co., Birmingham, Ala.  
Allentown P. C. Co., Catasauqua, Pa.  
Alpha P. C. Co., Easton, Pa.  
Ash Grove Lime and P. C. Co., Kansas City, Mo.  
Atlas P. C. Co., N. Y.  
Beaver P. C. Co., Portland, Ore.  
Bessemer Limestone & C. Co., Youngstown, O.  
British Col. Cement Co., Victoria, B. C.  
Canada Cement Co., Ltd., Montreal, Canada.  
Colorado P. C. Co., Denver, Colo.  
Consolidated Cement Corp., Chicago.  
Cowell P. C. Co., Cowell, Cal.  
Crescent P. C. Co., Wampum, Pa.  
Dewey P. C. Co., Kansas City, Mo.  
Diamond P. C. Co., Cleveland, O.  
Edison P. C. Co., N. Y.  
Georgia Cement & Stone Co., Birmingham, Ala.  
Giant P. C. Co., Philadelphia, Pa.  
Glens Falls P. C. Co., Glens Falls, N. Y.  
Glendon State P. C. Co., Los Angeles, Cal.  
Great West P. C. Co., Kans. C. Mo.  
Hawkeye P. C. Co., Des Moines, Ia.  
Hercules Cement Corp., Philadelphia.  
Hermitage P. C. Co., Nashville, Tenn.  
Huron P. C. Co., Detroit, Mich.  
Indiana P. C. Co., Indianapolis, Ind.  
International Cement Corp., N. Y.  
International P. C. Co., Ltd., Spokane, Wash.  
Kansas P. C. Co., Kansas City, Mo.  
Knickerbocker P. C. Co., Inc., Albany, N. Y.  
Kosmos P. C. Co., Louisville, Ky.  
La Tolteca Compania de Cemento Portland, Mexico City, Mex.  
Lawrence Cement Co., New York.  
Lehigh P. C. Co., Allentown, Pa.  
Louisiana P. C. Co., New Orleans.  
Louisville Cement Co., Louisville, Ky.  
Manitowoc P. C. Co., Manitowoc, Wis.  
Marlboro Cement Co., Edmonton, Can.  
Marquette Cement Mfg. Co., Chicago.  
Missouri P. C. Co., St. Louis, Mo.  
Monarch Cement Co., Humboldt, Kans.  
Monolith P. C. Co., Los Angeles, Cal.  
Nasareth Cement Co., Birmingham, Ala.  
Nasareth Cement Co., Denver, Colo.  
Newago P. C. Co., Newago, Mich.  
New Egyptian P. C. Co., Detroit.  
North Amer. Cement Corp., Albany, N. Y.  
Northwestern States P. C. Co., Mason City, Ia.  
Oklahoma P. C. Co., Denver.  
Olympic P. C. Co., Ltd., Seattle.  
Oregon P. C. Co., Portland, Ore.  
Pacific P. C. Co., San Francisco.  
Peerless P. C. Co., Detroit, Mich.  
Peninsular P. C. Co., Cement City, Mich.  
Penn-Allen Cement Co., Nazareth, Pa.  
Petoskey P. C. Co., Petoskey, Mich.  
Phoenix P. C. Co., Philadelphia.  
Pgh. Plate Glass Co., Zanesville, O.

P. C. Co. of Utah, Salt Lake City.  
Pyramid P. C. Co., Des Moines.  
Riverside P. C. Co., Los Angeles.  
St. Marys Cement Co., Toronto, Can.  
San Antonio P. C. Co., San Antonio.  
Sandusky Cement Co., Cleveland, O.  
Santa Cruz P. C. Co., San Francisco.  
Signal Mountain P. C. Co., Chattna, Tenn.  
Southern States P. C. Co., Rockport, Ga.  
Southwest P. C. Co., Los Angeles, Cal.  
Standard P. C. Co., Cleveland.  
Sun P. C. Co., Portland, Ore.  
Superior P. C. Co., Seattle, Wash.  
Texas P. C. Co., Dallas, Tex.  
Three Forks P. C. Co., Denver, Colo.  
Tidewater P. C. Co., Baltimore, Md.  
Trinity P. C. Co., Dallas, Tex.  
Union P. C. Co., Denver, Colo.  
U. S. P. C. Co., Denver, Colo.  
Universal P. C. Co., Chicago.  
Utah Idaho Cement Co., Ogden, Utah.  
Virginia P. C. Corp., Norfolk.  
Vulcanite P. C. Co., Philadelphia.  
Wabash P. C. Co., Detroit.  
Warrior Cement Corp., Chattna, Tenn.  
Wellston Iron Furnace Co., Jackson, O.  
Wolverine P. C. Co., Coldwater, Mich.  
Wyandotte P. C. Co., Detroit.

## CEMENT BLOCK MACHINES

\*Cement Block Machy. Co., Newark, N. J.  
Abrams Cement Tool Co., Detroit.

## CEMENT GUNS

\*Cement Gun Co., Allentown, Pa.

## CEMENT INSPECTION (See Inspecting Laboratories)

## CEMENT TOOLS

Abrams Cement Tool Co., Detroit.

## CENTRIFUGAL PUMPS (See Pumps, Centrifugal)

## CHAINS

\*Chain Belt Co., Milwaukee, Wis.  
\*Link-Belt Co., Chicago.  
Amer. Chain Co., Inc., Bridgeport, Conn.  
Columbus McKinnon Chain Co., Columbus, O.  
Diamond Chain & Mfg. Co., Indianapolis, Ind.  
Jeffrey Mfg. Co., Columbus, O.  
U. S. Chain & Forge Co., Pittsburgh, Pa.  
Webster Mfg. Co., Chicago.  
Weller Mfg. Co., Chicago.

## CHIMNEYS, CONCRETE

Heine Chimney Co., Chicago.  
Rust Engineering Co., Pittsburgh, Pa.  
Weber Chimney Co., Chicago.

## CHIMNEYS, RADIAL BRICK

Amer. Chimney Corp., N. Y.  
Continental Chimney Co. of Chi., Chicago  
Alphons Castodie Chimney Const. Co., N. Y.  
Heine Chimney Co., Chicago.  
H. R. Heinicke, Inc., Indianapolis, Ind.  
M. W. Kellogg & Co., N. Y.  
Rust Eng. Co., Pittsburgh, Pa.

## CHIMNEYS, STEEL (See Stacks, Steel)

## CHLORINATORS

\*Wallace & Tiernan Co., Inc., Newark, N. J.  
Paradon Eng. Co., Arlington, N. J.

## CHLORINE LIQUID (See Liquid Chlorine)

## CHUTES, CONCRETE

\*Insley Mfg. Co., Indianapolis, Ind.  
\*Lakewood Eng. Co., Cleveland, O.  
\*Ransome Conc. Mch. Co., Dunellen, N. J.

## CLAY DIGGERS, PNEUMATIC

\*Gardner-Denver Co., Denver, Col.  
\*Sullivan Machy Co., Chicago  
Ingersoll Pneumatic Tool Co., New York  
Ingersoll-Rand Co., New York

## CLAY PIPE

(See Pipe, Vitrified Clay)

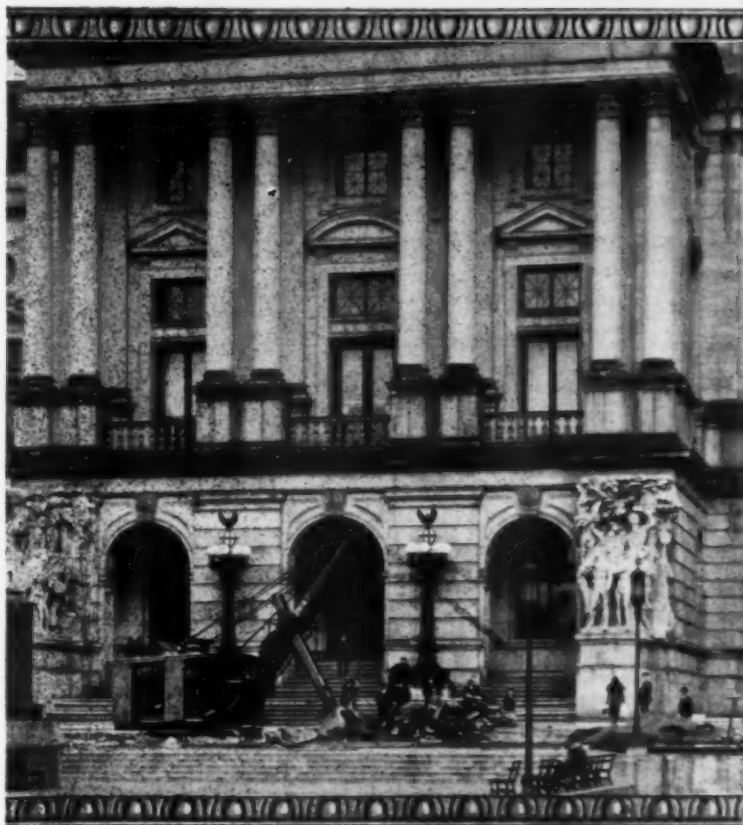
If you find any errors or omissions in this Where to Purchase list, please send corrections to

CONTRACTORS AND ENGINEERS MONTHLY



## When You Need a Smokeless Shovel

W. H. Murphy and  
Sons, Harrisburg,  
Pa. (6 Eries).  
Their Gas-Air Erie  
tearing up old con-  
crete, Pennsylvania  
State Capitol Build-  
ing, Harrisburg.



## that has the Power and Speed

When you have to rip up old concrete right alongside of beautiful buildings—

For *Smokelessness*, it takes a gasoline shovel.

For *Power, Speed, and Flexibility* to handle the hard digging, you need a Steam Erie.

And you can get such a combination in one machine. The Gas-Air Erie requires no coal

or water. Yet it has the speed and flexibility that only direct-connected crowding and swinging engines—operated by steam or compressed air—can give. No reversing friction clutches for hoisting, crowding or swinging.

The Gas-Air Erie is the gasoline shovel that has no rival for BIG PRODUCTION—and the large list of Repeat Orders is growing every day.

**ERIE STEAM SHOVEL CO., Erie, Pa., U. S. A.**

Branch Offices: Boston, New York, Philadelphia, Atlanta, Pittsburgh, Buffalo, Detroit, Chicago  
Representatives throughout the U. S. A.

**GAS-AIR ERIE DREADNAUGHT**  
SHOVELS, CRANES, DRAGLINES, ETC.

Yes—we would like you to mention the CONTRACTORS AND ENGINEERS MONTHLY.



# Where to Purchase

## OLIVE WIRE ROPE

- \*Amer. Steel & Wire Co., Chicago
- \*Amer. Hoist & Derrick Co., St. Paul, Minn.
- Fisher & Hayes Rope & Steel Co., Chicago
- Hasard Mfg. Co., Wilkesbarre, Pa.
- Thos. Laughlin Co., Portland, Me.
- Marion Malleable Ir. Wks., Marion, Ind.
- C. M. Mockbee & Co., Cincinnati, O.
- John A. Roebeling Sons Co., Trenton, N.J.
- Upson-Walton Co., Cleveland, O.

## CLUTCHES

- \*Link-Belt Co., Chicago
- \*Waukesha Motor Co., Waukesha, Wis.
- Twin Disc Clutch Co., Racine, Wis.

## COAL AND ORE CONVEYING MCHY.

- \*Barber-Greene Co., Aurora, Ill.
- \*Chain Belt Co., Milwaukee, Wis.
- \*Chicago Automatic Conv. Co., Chicago
- \*Good Roads Mch. Co., Kennett Sq., Pa.
- \*Geo. Haisa Mfg. Co., N. Y.
- \*Link-Belt Co., Chicago
- \*Mead-Morrison Mfg. Co., Boston, Mass.
- Austin Mfg. Co., Chicago
- C. O. Bartlett & Snow Co., Cleveland, O.
- Brown Hoisting Mch. Co., Cleveland, O.
- Fairfield Eng. Co., Marion, O.
- Gifford-Wood Co., Hudson, N. Y.
- C. W. Hunt Co., Inc., W. New Brighton, N. Y.
- Jeffrey Mfg. Co., Columbus, O.
- Lidgerwood Mfg. Co., N. Y.
- Portable Machy. Co., Clifton, N. J.
- Robins Conv. Belt Co., N. Y.
- Jas. B. Seaverns Co., Batavia, Ill.
- Webster Mfg. Co., Chicago
- Weller Mfg. Co., Chicago

## COCKS, CURB AND CORPORATION

- \*Union Wtr. Mtr. Co., Worcester, Mass.
- Chapman Valve Mfg. Co., Indian Orchard, Mass.
- Glauber Brass Mfg. Co., Cleveland, O.
- Haydenville Co., Haydenville, Mass.
- Hays Mfg. Co., Erie, Pa.
- Mueller Co., Decatur, Ill.

## COLLAPSIBLE HORSES

- Taylor Collapsible Horse Co., Chicago

## COLUMN CLAMPS

- \*Inaley Mfg. Co., Indianapolis, Ind.
- \*W. A. Kuhlman & Co., Toledo, O.
- \*Sterling Wheelbarrow Co., Milwaukee
- \*Williams Nat'l Form Clamp Co., Chicago
- M. & M. Form Clamp Co., Minneapolis
- The O. D. G. Co., Owensboro, Ky.
- Victor L. Phillips Co., Kansas City, Mo.
- H. W. Roos Co., Cincinnati
- Symons Clamp & Mfg. Co., Chicago
- Universal Form Clamp Co., Chicago

## COMPRESSORS, AIR (See Air Compressors)

## CONCRETE BLOCK MACHINES (See Cement Block Machines)

## CONCRETE FLOOR HARDENER

- Anti-Hydro Waterproofing Co., Newark, N. J.
- Euclid Chemical Co., Cleveland
- General Chemical Co., N. Y.
- Genflex Steel Co., Youngstown, O.
- Granitex Corp., N. Y.
- A. C. Horn Co., L. I. City, N. Y.
- Master Builders Co., Cleveland, O.
- L. Sonenshine Sons, Inc., N. Y.
- Truscon Laboratories, Detroit

## CONCRETE HEATERS

- \*Acroll Burner Co., West New York, N.J.
- \*Littleford Bros., Cincinnati
- \*Alex. Milburn Co., Baltimore, Md.
- Chausse Oil Burner Co., Elkhart, Ind.
- Hauk Mfg. Co., Brooklyn, N. Y.

## CONCRETE MIXERS

- \*Amer. Cem. Mch. Co., Inc., Keokuk, Ia.
- \*Atlas Eng. Co., Milwaukee
- \*Cement Block Machy. Co., Newark, N.J.

## \*Chain Belt Co., Milwaukee

- \*Cook Motor Co., Delaware, O.
- \*Jaeger Mach. Co., Columbus, O.
- \*Koehring Co., Milwaukee, Wis.
- \*Lakewood Eng. Co., Cleveland, O.
- \*John Lauson Mfg. Co., New Holstein, Wis.
- \*Ransome Con. Mch. Co., Dunellen, N.J.
- \*T. L. Smith Co., Milwaukee
- \*Republic Ir. Wks., Tecumseh, Mich.
- \*Standard Scale & Supply Co., Pittsburgh
- Anchor Mfg. Co., Chicago
- Archer Iron Wks., Chicago
- Badger Con. Mixer Co., Milwaukee
- Construction Mch. Co., Waterloo, Ia.
- J. B. Foote Fdry. Co., Fredericktown, O.
- Gray Iron Fdry. Co., Reading, Pa.
- Judy Mfg. Co., Centerville, Ia.
- Knickerbocker Co., Jackson, Mich.
- Kiel Mach. Co., Kiel, Wis.
- Kwik-Mix Concrete Mixer Co., Port Washington, Wis.
- Lansing Co., Lansing, Mich.
- Leach Co., Oshkosh, Wis.
- Marsh-Capron Co., Chicago
- Mixer-Mobile Co., Milwaukee
- Orr & Sombower, Reading, Pa.
- Raber & Lang Mfg. Co., Kendallville, Ind.
- Rommel Mfg. Co., Kewaskum, Wis.

## CONCRETE PAVERS

- \*Jaeger Mach. Co., Columbus, O.
- \*Koehring Co., Milwaukee
- \*Lakewood Eng. Co., Cleveland
- \*Ransome Con. Mch. Co., Dunellen, N.J.
- \*T. L. Smith Co., Milwaukee
- Foote Co., Nunda, N. Y.

## CONCRETE PILING (See Piling)

## CONCRETE PIPE (See Pipe, Concrete)

## CONCRETE REINFORCEMENT

- \*American Steel & Wire Co., Chicago
- \*Truscon Steel Co., Youngstown, O.
- Bethlehem Steel Co., Bethlehem, Pa.
- Carnegie Steel Co., Pittsburgh, Pa.
- Concrete Steel Co., N. Y.
- Consolidated Exp. Metal Co., Wheeling, W. Va.
- Electric Welding Co., Pittsburgh, Pa.
- Flt. Pitt Bridge Wks., Pittsburgh, Pa.
- Genflex Steel Co., Youngstown, O.
- Inland Steel Co., Chicago
- Kalman Steel Co., Chicago
- Laclede Steel Co., St. Louis, Mo.
- National Steel Fabric Co., Pittsburgh
- Republic Ir. & Stl. Co., Youngstown, O.
- J. T. Ryerson & Son, Chicago
- Wickwire-Spencer Steel Co., N. Y.
- Youngstown Pressed Steel Co., Warren, O.

## CONCRETE ROAD FINISHERS

- \*Helsel Stl. Form & Iron Co., Warren, O.
- \*A. W. French & Co., Chicago
- \*Lakewood Eng. Co., Cleveland, O.

## CONCRETE SURFACING MACHINES

- \*Concrete Surfacing Machy. Corp., Cincinnati, O.
- Ingersoll-Rand Co., New York

## CONCRETE TOOLS

- \*The Dallett Co., Philadelphia

## CONDENSERS

- Allis-Chalmers Mfg. Co., Milwaukee
- Ingersoll-Rand Co., N. Y.
- Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.
- Wheeler Cond. & Eng. Co., Osteret, N.J.
- Worthington Pump & Machy Corp., N.Y.

## CONDUIT RODS

- F. Bissell Co., Toledo, O.
- Robins Sewer Mch. Co., Milwaukee
- Walde Bros. & Bond Co., Boston

## CONDUITS, UNDERGROUND

- Amer. Vittr. Products Co., Akron, O.
- Johns-Manville, Inc., N. Y.
- National Fireproofing Co., N. Y.

## Ric-Wil Co., Cleveland

## CONTRACTORS' EQUIPMENT DEALERS (See Pages 155 to 191)

## CONVEYORS, BELT

- \*Atlas Eng. Co., Milwaukee
- \*Austin-Western Ed. Mch. Co., Chicago
- \*Barber-Greene Co., Aurora, Ill.
- \*Chain-Belt Co., Chicago
- \*Chicago Automatic Conv. Co., Chicago
- \*Gallon Ir. Wks. & Mfg. Co., Galien, O.
- \*Good Eds. Mch. Co., Kennett Sq., Pa.
- \*Geo. Haisa Mfg. Co., N. Y.
- \*Jos. Honhorst Co., Cincinnati
- \*Link-Belt Co., Chicago
- \*Northern Conveyor Co., Janesville, Wis.
- \*Russell Grader Mfg. Co., Minneapolis
- \*Smith Eng. Wks., Milwaukee
- Austin Mfg. Co., Chicago
- C. O. Bartlett & Snow Co., Cleveland
- Brown Hoisting Machy. Co., Cleveland
- Fairfield Eng. Co., Marion, Ohio
- Gifford Wood Co., Hudson, N. Y.
- Jeffrey Mfg. Co., Columbus, O.
- New Holland Mch. Co., N. Holland, Pa.
- Portable Machinery Co., Clifton, N. J.
- Samuel Olson & Co., Chicago
- Robins Conv. Belt Co., N. Y.
- Jas. B. Seaverns Co., Batavia, Ill.
- Standard Conv. Co., No. St. Paul, Minn.
- Stephens-Adamsen Mfg. Co., Aurora, Ill.
- Universal Crusher Co., Cedar Rapids, Ia.
- Webster Mfg. Co., Chicago
- Weller Mfg. Co., Chicago

## CONVEYORS, BUCKET

- \*Atlas Eng. Co., Milwaukee
- \*Chain Belt Co., Milwaukee
- \*Chicago Automatic Conv. Co., Chicago
- \*Good Roads Machy. Co., Kennett Sq., Pa.
- \*Geo. Haisa Mfg. Co., N. Y.
- \*Jos. Honhorst Co., Cincinnati, O.
- \*Link-Belt Co., Chicago
- \*Mead-Morrison Mfg. Co., Boston, Mass.
- \*Russell Grader Mfg. Co., Minneapolis
- Austin Mfg. Co., Chicago
- C. O. Bartlett & Snow Co., Cleveland, O.
- Brown Hoisting Machy. Co., Cleveland, O.
- H. W. Caldwell & Son, Chicago
- Fairfield Eng. Co., Marion, O.
- Gifford Wood Co., Hudson, N. Y.
- Godfrey Conv. Co., Elkhart, Ind.
- Guarantee Constn. Co., N. Y.
- Jeffrey Mfg. Co., Columbus, O.
- New Holland Mch. Co., N. Holland, Pa.
- Samuel Olson & Co., Chicago
- Republic Rubber Co., Youngstown, O.
- Robins Conv. Belt Co., N. Y.
- Jas. B. Seaverns Co., Batavia, Ill.
- Stephens Adamsen Mfg. Co., Aurora, Ill.
- Universal Crusher Co., Cedar Rapids, Ia.
- Webster Mfg. Co., Chicago
- Weller Mfg. Co., Chicago

## CONVEYORS, GRAVITY

- Lamson Co., Syracuse, N. Y.
- Logan Co., Louisville, Ky.
- Mathews Conveyor Co., Elwood City, Pa.
- Standard Conv. Co., No. St. Paul, Minn.

## COUPLINGS, HOSE

- \*Hardsoc Wonder Dr. Co., Ottumwa, Ia.
- Cleveland Pneum. Tool Co., Cleveland, O.
- Gilman Mfg. Co., East Boston, Mass.
- Ingersoll-Rand Co., N. Y.
- W. H. Keller, Inc., Grand Haven, Mich.
- Mulcahey Co., Philadelphia

## CRANES, CRAWLER

- \*Erie Steam Shovel Co., Erie, Pa.
- \*Link-Belt Co., Chicago
- \*Mead-Morrison Mfg. Co., Boston
- \*Orton Crane & Shovel Co., Chicago
- \*Star Drilling Mach. Co., Akron, O.
- \*Thew Shovel Co., Lorain, Ohio
- Austin Machy. Corp., Muskegon, Mich.
- Byers Mach. Co., Ravenna, O.
- McMyler Interstate Co., Cleveland
- Osgood Co., Marion, Ohio
- Universal Crane Co., Cleveland

\* Indicates that the manufacturer carries an advertisement. See index facing inside back cover.\*



# HAISS TRUCK LOADERS

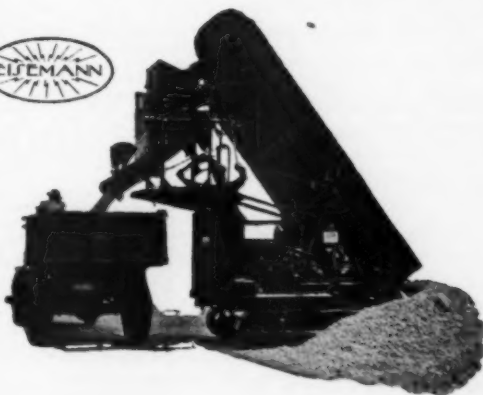
*are* Eisemann Equipped!

A FAULTY, unreliable, inefficient ignition system would be singularly out of place on heavy machinery such as this. It would thwart the very economies such labor-saving devices are designed to effect.

The builders of HAISS Loaders spare no expense to give their buyers as fine an ignition system as money can buy—an Eisemann Magneto.

Rain or Shine, the magneto functions without interruption. It starts the engine easily, even in the coldest weather. And it requires little or no attention.

EISEMANN MAGNETO CORPORATION  
165 Broadway, New York  
DETROIT • SAN FRANCISCO • CHICAGO



# EISEMANN

## ELECTRICAL EQUIPMENT

# Where to Purchase

## CRANES, LOCOMOTIVE

\*Bay City Dredge Wks., Bay City, Mich.  
 \*Erie Steam Shovel Co., Erie, Pa.  
 \*Koehring Co., Milwaukee.  
 \*Link-Belt Co., Chicago.  
 \*Mead-Morrison Mfg. Co., Boston.  
 \*Orton Crane & Shovel Co., Chicago.  
 \*Parsons Co., Newton, Iowa.  
 \*Speeder Machy. Corp., Cedar Rapids, Ia.  
 \*Thew Shovel Co., Lorain, O.  
 Amer. Hst. & Derrick Co., St. Paul, Minn.  
 Brown Hoisting Machy. Co., Cleveland.  
 Browning Crane Co., Cleveland, O.  
 Davenport Loc. Wks., Davenport, Ia.  
 Industrial Wks., Bay City, Mich.  
 Loc. Crane Co. of Amer., Champaign, Ill.  
 Marion Steam Shovel Co., Marion, O.  
 McMyler Interstate Co., Cleveland, O.  
 Moore Speeder Crane Co., Chicago.  
 Northwest Eng. Works, Chicago.  
 Ohio Loc. Crane Co., Bucyrus, O.  
 Jas. B. Seaverns Co., Batavia, Ill.  
 U. S. Crane Co., Chicago.

## CRANES, ONE-TON

\*Whitehead & Kales Co., Detroit, Mich.  
 Hughes-Keenan Co., Mansfield, O.  
 Otis Eng. Co., New York.

## CRANES, OVERHEAD TRAVELING

Alliance Mach. Co., Alliance, O.  
 Chesapeake Iron Wks., Baltimore, Md.  
 Chisholm-Moore Mfg. Co., Cleveland.  
 Curtis Pn. Mach. Co., St. Louis.  
 Harnischfeger Corp., Milwaukee, Wis.  
 Milwaukee Elec. Crane Co., Milwaukee.  
 Morgan Eng. Co., Alliance, O.  
 Northern Eng. Wks., Detroit, Mich.  
 Shaw Crane Wks., Muskegon, Mich.  
 Sheppard Elec. Cr. & Hst. Co., Montour Falls, N. Y.  
 Toledo Crane Co., Bucyrus, O.  
 Whiting Fdry. & Equip. Co., Harvey, Ill.

## CRANES, TRUCK

\*Erted Michy. Mfg. Co., Portland, Ore.  
 \*Orton Crane & Shovel Co., Chicago.  
 Atia Corp., New York.  
 Bay City Fdry. & Mach. Co., Bay City, Mich.  
 Browning Crane Co., Cleveland.  
 Byers Mach. Co., Ravenna, O.  
 Harnischfeger Corp., Milwaukee, Wis.  
 Universal Crane Co., Cleveland.

## CRANES, WRECKING

Bucyrus Co., So. Milwaukee, Wis.  
 Industrial Wks., Bay City, Mich.

## CRAWLER ATTACHMENTS

\*Geo. Haisz Mfg. Co., New York.  
 \*Link-Belt Co., Chicago.  
 \*Truckson Co., Milwaukee, Wis.  
 Belle City Mfg. Co., Racine, Wis.

## CREOSOTED BLOCKS, TIMBER, ETC.

Amer. Creos. Co., Inc., Louisville, Ky.  
 Amer. Creos. Wks., Inc., N. Orleans, La.  
 Carter Bloxomend Flooring Co., K. City, Mo.  
 Colonial Cre. Co., Inc., Louisville, Ky.  
 Compressed Wood Preserving Co., Cincinnati, O.  
 Creos. Materials Co., N. Orleans, La.  
 Georgia Creos. Co., Louisville, Ky.  
 Jennison-Wright Co., Toledo, O.  
 Long Bell Lumber Co., Kansas City, Mo.  
 Midland Creos. Co., Granite City, Ill.  
 Pensacola Creosoting Co., Pensacola, Fla.  
 Republic Creos. Co., Indianapolis, Ind.  
 Southern Wood Pres. Co., Atlanta, Ga.  
 Wyckoff Pipe & Creos. Co., N. Y.

## CREOSOTING AND CREOSOTING OILS

\*Barrett Co., N. Y.  
 Amer. Creos. Wks., Inc., N. Orleans, La.  
 Amer. Tar Prod. Co., Pittsburgh, Pa.  
 Jennison-Wright Co., Toledo, O.  
 Southern Creos. Co., Slidell, La.  
 Southern Pavg. Const. Co., Chattanooga.  
 Wyckoff Pipe & Creos. Co., N. Y.

## CRUSHERS, ROCK

\*Acme Rd. Machy. Co., Frankfort, N. Y.  
 \*Austin-Western Rd. Mach. Co., Chicago.  
 \*Gallon Iron Wks. & Mfg. Co., Gallon, O.  
 \*Good Bds. Machy. Co., Kennett Sq., Pa.  
 \*Russell Grader Mfg. Co., Minneapolis.  
 \*Smith Eng. Wks., Milwaukee.  
 Austin Mfg. Co., Chicago.  
 New Holland Mach. Co., New Holland, Pa.  
 Sturtevant Mill Co., Boston.  
 Universal Crusher Co., Cedar Rapids, Ia.  
 Universal Rd. Mch. Co., Kingston, N.Y.

## CULVERTS, CAST IRON

\*Gallon Ir. Wks. & Mfg. Co., Gallon, O.  
 \*U. S. C. I. Pipe & Fdry. Co., Burlington, N. J.  
 Amer. C. I. Pipe Co., Birmingham, Ala.  
 Beach Mfg. Co., Charlotte, Mich.  
 Gilbert Mfg. Co., Aberdeen, S. D.  
 R. D. Wood & Co., Philadelphia.

## CULVERTS, CORRUGATED METAL

\*Austin-Western Rd. Mach. Co., Chicago.  
 \*Gallon Iron Wks. & Mfg. Co., Gallon, O.  
 \*Good Bds. Mach. Co., Kennett Sq., Pa.  
 Austin Mfg. Co., Chicago.  
 Bark River Bridge & Culv. Co., Bark River, Mich.  
 Beach Mfg. Co., Charlotte, Mich.  
 Berger Mfg. Co., Jacksonville, Fla.  
 Boardman Co., Okla. City, Okla.  
 Burnham Mfg. Co., Woods Cross, Utah.  
 Calif. Corr. Culv. Co., W. Berkeley, Cal.  
 Canada Moore Ir. Co., Ltd., Guelph, Ont.  
 Canton Culv. & Silo Co., Canton, O.  
 Coast Culv. & Flume Co., Portland, Ore.  
 Corr. Culv. Co., Moberly, Mo.  
 Dixie Culv. & Metal Co., Atlanta, Ga.  
 Dixie Culv. Mfg. Co., Little Rock, Ark.  
 Gilbert Mfg. Co., Aberdeen, S. D.  
 H. Hardesty Mfg. Co., Denver, Colo.  
 Highway Prod. & Mfg. Co., Elmira, N.Y.  
 Ind. Corr. Culv. Co., Mason City, Ia.  
 Iowa Pure Ir. Co., Des Moines, Ia.  
 Klauer Mfg. Co., Dubuque, Ia.  
 Lyle Culv. & Rd. Equip. Co., Minneapolis, Minn.  
 Md. Culv. & Metal Co., Baltimore.

N. E. Metal Culv. Co., Palmer, Mass.  
 Nebraska Culv. & Mfg. Co., Wahoe, Neb.  
 Newport Culvert Co., Newport, Ky.  
 North East Metal Culv. Co., Nashua, N.H.  
 Northfield Ir. Co., Northfield, Minn.  
 Northwestern Sheet & Ir. Wks., Wapeton, N. D.  
 Ohio Corr. Culv. Co., Middletown, O.  
 W. Q. O'Neill Co., Crawfordville, Ind.  
 Road Supply & Metal Co., Topeka, Kan.  
 Sioux Falls Metal Culv. Co., Sioux Falls, S. D.

So. Metal Culv. Co., Salisbury, N. C.  
 Spokane Culv. & Tank Co., Spokane.  
 Tenn. Metal Culv. Co., Nashville.  
 U. S. Br. & Culv. Co., Bay City, Mich.  
 Va. Metal Mfg. Co., Roanoke, Va.  
 Western Metal Mfg. Co., Houston, Tex.  
 Wheeling Corr. Co., Wheeling, W. Va.  
 Wyatt Metal & Blr. Wks., Dallas, Tex.

## CULVERT FORMS

\*Blaw-Knox Co., Pittsburgh, Pa.  
 Concrete Form Co., Inc., Syracuse, N.Y.  
 Northfield Iron Co., Northfield, Minn.

## CURE BOXES

Casey-Hedges Co., Chattanooga, Tenn.  
 H. W. Clark Co., Mattoon, Ill.  
 J. B. Clow & Sons, Chicago.  
 Madison Fdry. Co., Cleveland, O.  
 Mueller Co., Decatur, Ill.

## CURE, CUTTER AND BASE FORMS

(See Forms, Concrete)

## CURE GUARDS, STEEL

W. S. Godwin Co., Baltimore.

## CURE, STEEL PROTECTED

\*Truscon Steel Co., Youngstown, O.  
 Concrete Steel Co., N. Y.

## CURING OF CONCRETE

\*Dow Chemical Co., Midland, Mich.  
 \*Solvay Sales Corp., N. Y.

## CUTTERS, PIPE, HAND

Armstrong Mfg. Co., Bridgeport, Ct.  
 Barnes Tool Co., New Haven, Ct.  
 Ellis & Ford Mfg. Co., Detroit.  
 Erie Tool Works, Erie, Pa.  
 Greenfield Tap & Die Corp., Greenfield, Mass.  
 Oswego Tool Co., Oswego, N. Y.  
 Reed Mfg. Co., Erie, Pa.  
 Walworth Mfg. Co., Boston.

## CUTTERS, ROD AND WIRE

\*Koehring Co., Milwaukee, Wis.  
 Buffalo Forge Co., Buffalo, N. Y.  
 Carolus Mfg. Co., Sterling, Ill.  
 C. D. Edwards Mfg. Co., Albert Lea, Minn.  
 Helwig Mfg. Co., St. Paul, Minn.  
 M. & M. Wire Clamp Co., Minneapolis.  
 Worthington Pump & Mch. Corp., N.Y.

## CUTTING EDGES

\*Russell Grader Mfg. Co., Minneapolis.  
 J. D. Adams & Co., Indianapolis, Ind.  
 Shunk Mfg. Co., Bucyrus, O.

## CUTTING AND WELDING APPARATUS

(See Welding Apparatus)

## CYLINDER HEADS, RICARDO

\*Waukesha Motor Co., Waukesha, Wis.

## DERRICKS, GUY AND STIFF-LEG

\*Clyde Ir. Wks. Sales Co., Duluth, Minn.  
 \*Dobbie Fdry. & Mach. Co., Niagara Falls, N. Y.  
 \*S. Flory Mfg. Co., Bangor, Pa.  
 \*Insley Mfg. Co., Indianapolis, Ind.  
 \*Mundy Sales Corp., N. Y.  
 \*Saggen Derrick Co., Chicago.  
 \*Universal Hstg. Machy. Corp., Buffalo.  
 Amer. Hst. & Derrick Co., St. Paul, Minn.  
 John T. Horton Co., N. Y.  
 Lakeside Bridge & Steel Co., N. Milwaukee, Wis.  
 Lidgerwood Mfg. Co., N. Y.  
 National Hstg. Eng. Co., Harrison, N. J.  
 Street Bros. Mach. Wks., Chattanooga.  
 Superior Iron Wks., Superior, Wis.

## DERRICKS, PIPE LAYING

\*Dobbie Fdry. & Mach. Co., Niagara Falls.  
 Lidgerwood Mfg. Co., N. Y.  
 Street Bros. Mach. Wks., Chattanooga.

## DERRICKS, REVOLVING

\*Clyde Ir. Wks. Sales Co., Duluth, Minn.  
 \*Dobbie Fdry. & Mach. Co., Niagara Falls.  
 Street Bros. Mach. Wks., Chattanooga.

## DERRICKS, STEEL

\*Clyde Ir. Wks. Sales Co., Duluth, Minn.  
 \*Dobbie Fdry. & Mach. Co., Niagara Falls.  
 \*Insley Mfg. Co., Indianapolis, Ind.  
 Amer. Hst. & Derrick Co., St. Paul.  
 Hayward Co., N. Y.  
 Street Bros. Mach. Wks., Chattanooga.  
 Taylor Port. St. Derrick Co., Chicago.

## DERRICKS, STEEL PORTABLE

\*Clyde Ir. Wks. Sales Co., Duluth, Minn.  
 \*Dobbie Fdry. & Mach. Co., Niagara Falls.  
 Amer. Hst. & Derrick Co., St. Paul.  
 Atia Corp., New York.  
 Lidgerwood Mfg. Co., N. Y.  
 Street Bros. Mach. Wks., Chattanooga.

## DERRICKS, TRAVELING

\*Bay City Dredge Wks., Bay City, Mich.  
 \*Clyde Ir. Wks. Sales Co., Duluth, Minn.  
 \*Dobbie Fdry. & Mach. Co., Niagara Falls.  
 \*Orton Crane & Shovel Co., Chicago.  
 Amer. Hst. & Derrick Co., St. Paul.  
 Hayward Co., N. Y.  
 Nat'l. Hstg. Eng. Co., Harrison, N. J.  
 Street Bros. Mach. Wks., Chattanooga.

## DERRICK FITTINGS

\*S. Flory Mfg. Co., Bangor, Pa.  
 \*Mundy Sales Corp., N. Y.  
 Amer. Hst. & Derrick Co., St. Paul.  
 Hayward Co., N. Y.  
 Lidgerwood Mfg. Co., N. Y.  
 Street Bros. Mach. Wks., Chattanooga.

If you find any errors or omissions in this Where to Purchase list, please send corrections to

CONTRACTORS AND ENGINEERS MONTHLY



## New --and better than ever

The ORTON Model "V" Clamshell has always been a good bucket, both for digging and handling material. Now, with new ORTON features, it is better than ever.

Its new flat braced back arms, interlocking bronzed bushed hinges, offset cable sheaves, Alemite-Zerk Lubricating System and many other improvements in design and construction make it one of the sturdiest and easiest-operating buckets built. It is the finest product of our twenty-five years' experience.

The ORTON Clamshell Bucket plunges into the material and comes up with a full bucket-load every time because it has weight enough to bury itself in the material, spread enough to collect a full bucket-load, and speed enough to insure three trips a minute—an ideal bucket for all types of excavating and material-handling.

We shall be glad to send to anyone interested complete information, including specifications and price of this new ORTON Bucket. Write us today.

The ORTON Clamshell is built in sizes from  $\frac{1}{2}$  to 5 yards

Cranes **ORTON** Shovels  
 ORTON CRANE & SHOVEL COMPANY, 608 SO. DEARBORN ST., CHICAGO, ILL.

Do you mention the CONTRACTORS AND ENGINEERS MONTHLY when writing? Please do.



# Where to Purchase

## DIAPHRAGM PUMPING OUTFITS

\*John Lanson Mfg. Co., New Holstein, Wis.

## DIESEL ENGINES (See Engines, Oil)

## DISTRIBUTORS, TAR AND ASPHALT

\*Kinney Mfg. Co., Boston  
E. D. Etnyre & Co., Oregon, Ill.  
Municipal Supply Co., So. Bend, Ind.

## DISTRIBUTING PLANTS, CONCRETE

\*Lakewood Eng. Co., Cleveland.  
\*Insley Mfg. Co., Indianapolis, Ind.  
\*Ransome Conc. Mch. Co., Dunellen, N.J.

## DITCHING MACHINES (See Excavators)

## DOORS AND SHUTTERS, STEEL ROLLING

Cornell Iron Wks., B'klyn., N. Y.  
Kinnear Mfg. Co., Columbus, O.  
Variety Fire Door Co., Chicago  
J. G. Wilson Corp., N. Y.

## DRAFTING MACHINES

Univ. Drafting Mach. Co., Cleveland, O.

## DREDGES

\*Bay City Dredge Wks., Bay City, Mich.  
\*Oortan Gray & Shovel Co., Chicago.  
Amer. Steel Dredge Co., Ft. Wayne, Ind.  
Bucyrus Co., So. Milwaukee, Wis.  
Ellicott Machy. Corp., Baltimore  
Hayward Co., N. Y.  
Marion Steam Shovel Co., Marion, O.  
Osgood Co., Marion, O.  
J. S. Schofield's Sons Co., Macon, Ga.  
Stockton Iron Wks., Stockton, Cal.  
Street Bros. Mach. Wks., Chattanooga  
Superior Iron Wks., Superior, Wis.

## DREDGES, DIPPER

\*Bay City Dredge Wks., Bay City, Mich.  
\*Link-Belt Co., Chicago.  
Amer. Steel Dredge Co., Ft. Wayne, Ind.  
Bucyrus Co., So. Milwaukee, Wis.  
Marion Steam Shovel Co., Marion, O.  
Osgood Co., Marion, O.

## DREDGES, HYDRAULIC

Bucyrus Co., South Milwaukee, Wis.  
Ellicott Mach. Corp., Baltimore.  
Marion Steam Shovel Co., Marion, O.  
Morris Mach. Wks., Baldwinville, N.Y.

## DREDGING MACHINERY

\*S. Flory Mfg. Co., Bangor, Pa.  
\*Mundy Sales Corp., N. Y.  
Lidgerwood Mfg. Co., N. Y.  
Street Bros. Mach. Wks., Chattanooga.

## DREDGING PUMPS AND ACCESSORIES

Erie Pump & Engine Wks., Medina, N.Y.  
Ingersoll-Rand Co., N. Y.

## DRILL STEEL SHARPENERS

(See Sharpeners)

## DRILLS, CORE

\*McKiernan-Terry Drill Co., N. Y.  
\*Sullivan Machy. Co., Chicago.  
Ingersoll-Rand Co., N. Y.

## DRILLS, ROCK

\*Dalzell Co., Philadelphia.  
\*Gardner-Denver Co., Denver, Col.  
\*Hardsag Wonder Drill Co., Ottumwa, Ia.  
\*Sullivan Machy. Co., Chicago.  
Chicago Pneum. Tool Co., N. Y.  
Cleveland Pneum. Tool Co., Cleveland, O.  
Cleveland Rock Drill Co., Cleveland, O.  
Gilman Mfg. Co., E. Boston.  
Helwig Mfg. Co., St. Paul, Minn.  
Ingersoll-Rand Co., N. Y.  
W. H. Keller, Inc., Grand Haven, Mich.  
Wood Drill Wks., Paterson, N. J.

## DRILLS FOR WELLS AND BLAST

HOLES (See Well Drilling Machinery)

## DRUMS, FOLDING

\*Blaw-Knox Co., Pittsburgh, Pa.

\*Clyde Ir. Wks. Sales Co., Duluth, Minn.

\*Dobbie Fdry. & Mch. Co., Niagara Falls.

\*Holtzel Steel Form & Ir. Co., Warren, O.

Hayward Co., N. Y.

Street Bros. Mach. Wks., Chattanooga.

## DYERS, ASPHALT AND CEMENT

Allis-Chalmers Mfg. Co., Milwaukee.  
Amer. Blower Co., Detroit, Mich.  
Atlas Dryer Co., Cleveland, O.  
C. O. Bartlett & Snow Co., Cleveland, O.  
F. D. Cumber & Son Co., Cleveland, O.  
Mosher Mfg. Co., Chicago.  
Ruggles-Coles Eng. Co., N. Y.

## DYERS, SAND AND GRAVEL

\*Asroll Burner Co., West New York, N.J.  
\*Joa. Honhorst Co., Cincinnati, O.  
\*Littleford Bros., Cincinnati, O.  
\*Alex. Milburn Co., Baltimore, Md.  
Amer. Process Co., N. Y.  
C. O. Bartlett & Snow Co., Cleveland, O.  
Chase & Lyman, Boston  
Chausse Oil Burner Co., Elkhart, Ind.  
Mosher Mfg. Co., Chicago.

## DUMP BODIES FOR CONCRETE

Easton Car & Const. Co., Easton, Pa.  
Lee Trailer & Body Co., Plymouth, Ind.

## DUMP BODIES FOR MOTOR TRUCKS

\*Hell Co., Milwaukee.  
\*Highway Trailer Co., Edgerton, Wis.  
\*Littleford Bros., Cincinnati, O.  
\*Mack Trucks, Inc., N. Y.  
\*Marion Steel Body Co., Marion, O.  
\*Van Dorn Iron Wks. Co., Cleveland, O.  
\*Wood Hydr. Hoist & Body Co., Detroit.  
Amer. Prod. & Trac. Co., Chicago.  
Am. Truck & Body Co., Martinsville, Va.  
Anthony Co., Streator, Ill.  
Atia Corp., New York.  
Columbia Body Corp., Columbia, Pa.  
Columbian St. Tank Co., Kansas City, Mo.  
Detroit Trailer & Mach. Co., Detroit.  
Detweiler Mfg. Co., Gallon, O.  
Eagle Wagon Wks., Auburn, N. Y.  
Easton Car & Const. Co., Easton, Pa.  
Gallon All Steel Body Co., Gallon, O.  
Grison-Russell Co., N. Y.  
Herr Dump Car Mfg. Co., Coatesville, Pa.  
Hughes-Keenan Co., Mansfield, O.  
The Hug Co., Highland, Ill.  
Jennings Aut. Dump Body, Roanoke, Va.  
Lee Trailer & Body Co., Plymouth, Ind.  
Mandt Body Co., Keokuk, Ia.  
Martin-Parry Corp., York, Pa.  
N. Y. Central Ir. Wks., Hagerstown, Md.  
Pechstein Iron Wks., Keokuk, Ia.  
Stewart Iron Wks. Co., Cincinnati.

## DUMP CARTS AND WAGONS, HORSE

\*Acme Bd. Machy. Co., Frankfort, N. Y.  
\*Austin-Western Rd. Machy. Co., Chicago.  
\*Eagle Wagon Wks., Auburn, N. Y.  
\*Highway Trailer Co., Edgerton, Wis.  
\*La Plant-Cheate Mfg. Co., Cedar Rapids, Ia.

\*Russell Grader Mfg. Co., Minneapolis.

Acme Wagon Co., Emigsville, Pa.  
J. D. Adams & Co., Indianapolis.  
Austin Mfg. Co., Chicago.

Bain Wagon Co., Kenosha, Wis.

Columbia Body Corp., Columbia, Pa.

Electric Wheel Co., Quincy, Ill.

Gilbert Mfg. Co., Aberdeen, S. D.

Hagy Wagon Co., Abingdon, Va.

G. H. Holzbor & Bro., Jeffersonville, Ind.

Little Red Wagon Co., Omaha, Neb.

Luedinghaus-Espenchied Wagon Co., St. Louis.

Rex-Watson Corp., Canastota, N. Y.

Stockland Rd. Machy. Co., Minneapolis.

Strick Bros., Oakshosh, Wis.

Thornhill Wagon Co., Lynchburg, Va.

Western Wheeled Scraper Co., Aurora, Ill.

## DUMP WAGONS, (ALL STEEL), TRACTOR DRAWN

\*Euclid Cr. & Hst. Co., Euclid Village, O.

\*La Plant-Cheate Mfg. Co., Cedar Rapids, Iowa.

Lenhart Wagon Co., Minneapolis.

## DYNAMITE (See Explosives)

## EJECTORS, SEWAGE (See Sewage Ejectors)

## ELECTRIC GENERATORS AND MOTORS

Louis Allis Co., Milwaukee.  
Allis-Chalmers Mfg. Co., Milwaukee.  
Crocker-Wheeler Co., Ampere, N. J.  
Fairbanks, Morse & Co., Chicago.  
General Elec. Co., Schenectady, N. Y.  
Graybar Electric Co., New York.  
Ideal Elec. & Mfg. Co., Mansfield, O.  
Lincoln Elec. Co., Cleveland, O.  
Robbins & Myers Co., Springfield, O.  
Wagner Elec. Mfg. Co., St. Louis.  
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

## ELECTRIC LAMPS

General Elec. Co., Schenectady, N. Y.  
Westinghouse Lamp Co., N. Y.

## ELECTRIC LIGHTING PLANTS

\*Climax Eng. Co., Clinton, Ia.  
\*Cook Motor Co., Delaware, O.  
Allis-Chalmers Mfg. Co., Milwaukee.  
Cushman Motor Wks., Lincoln, Neb.  
Fairbanks, Morse & Co., Chicago.  
Fuller & Johnson Mfg. Co., Madison, Wis.  
General Elec. Co., Schenectady, N. Y.  
Graybar Electric Co., New York.  
Klauer Mfg. Co., Dubuque, Iowa.  
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

## ELECTRIC TRANSFORMERS

Allis-Chalmers Mfg. Co., Milwaukee.  
General Elec. Co., Schenectady, N. Y.  
Kuhlman Elec. Co., Bay City, Mich.  
Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.

## ELECTRIC WIRES (See Wire)

## ELEVATORS, BUCKET

\*Atlas Eng. Co., Milwaukee.  
\*Austin-Western Rd. Machy. Co., Chicago.  
\*Chain Belt Co., Milwaukee, Wis.  
\*Good Rds. Machy. Co., Kennett Sq., Pa.  
\*Geo. Hais Mfg. Co., N. Y.  
\*Link-Belt Co., Chicago.  
\*Littleford Bros., Cincinnati.  
\*Russell Grader Mfg. Co., Minneapolis.  
\*Spears-Wells Machy. Co., Oakland, Cal.  
Abrams Cement Tool Co., Detroit.  
Austin Mfg. Co., Chicago.  
C. O. Bartlett & Snow Co., Cleveland, O.  
Brown Hatg. Machy. Co., Cleveland, O.  
Fairfield Eng. Co., Marion, Ohio.  
Gifford-Wood Co., Hudson, N. Y.  
Jeffrey Mfg. Co., Columbus, O.  
New Holland Mch. Co., N. Holland, Pa.  
Robins Conv. Belt Co., N. Y.  
Stephens-Adams Mfg. Co., Aurora, Ill.  
Univ. Rd. Machy. Co., Kingston, N. Y.  
Webster Mfg. Co., Chicago.  
Weller Mfg. Co., Chicago.  
Worthington Pump & Mch. Corp., N.Y.

## ELEVATORS, PASSENGER, FREIGHT, ETC.

Am. Elev. & Mach. Co., Louisville, Ky.  
Atlantic Elev. Co., Inc., Philadelphia.  
Bay State Elev. Co., Springfield, Mass.  
Houghton Elev. & Mach. Co., Toledo, O.  
Kaesler & Hecht Co., Chicago  
Lewellyn Ir. Wks., Los Angeles, Cal.  
Montgomery Elev. Co., Moline, Ill.  
Otis Elevator Co., N. Y.  
C. Ridgway & Son Co., Coatesville, Pa.  
A. B. See Elec. Elev. Co., N. Y.  
Spindel Elev. Corp., Reading, Pa.  
Warner Elev. Mfg. Co., Cincinnati.  
Warsaw Elev. Co., Warsaw, N. Y.

## ENGINE DREDGING

Murray Ir. Wks. Co., Burlington, Ia.

## ENGINES, FORD REPLACEMENT

\*Waukesha Motor Co., Waukesha, Wis.

\* Indicates that the manufacturer carries an advertisement. See index facing inside back cover.\*



## A LIGHT $\frac{1}{2}$ YARD SHOVEL

*Should be Light*



### The SPEEDER Has No Wasted Weight

The Speeder  $\frac{1}{2}$ -yard, full-revolving shovel was designed for mobility. Sturdy strength wherever needed but all unnecessary weight eliminated by simplified construction—only 17 gears on a Speeder. The positive cable crowd needs no boom engine or gearing—additional weight to be offset with additional counterweight. The value of a light shovel is measured in yards, not in pounds. The pioneer Speeder is the big value in the half-yard field. The new Speeder catalog will be mailed on request.

### SPEEDER MACHINERY CORPORATION

1215 South Sixth Street West

Cedar Rapids, Iowa

*C.K.*

Yes—we would like you to mention the CONTRACTORS AND ENGINEERS MONTHLY.

# Where to Purchase

## ENGINES, GAS AND GASOLINE

- \*Alamo Eng. Co., Hillsdale, Mich.
- \*Caterpillar Tractor Co., San Leandro, Cal.
- \*Climax Eng. Co., Clinton, Ia.
- \*Continental Motors Corp., Muskegon, Mich.
- \*Cook Motor Co., Delaware, O.
- \*Domestic Eng. & Pump Co., Shippensburg, Pa.
- \*Erted Mfg. Co., Portland, Ore.
- \*Hercules Motors Corp., Canton, O.
- \*F. Van Rossen Hoogendyk, New York.
- \*John Lanson Mfg. Co., New Holstein, Wis.
- \*Le Roi Co., Milwaukee.
- \*Link-Belt Co., Chicago.
- \*Nove Engine Co., Lansing, Mich.
- \*Stover Mfg. & Eng. Co., Freeport, Ill.
- \*Waukesha Motor Co., Waukesha, Wis.
- \*Witte Engine Wks., Kansas City, Mo.
- \*Allis-Chalmers Mfg. Co., Milwaukee.
- \*Beaver Mfg. Co., Milwaukee, Wis.
- \*Buda Co., Harvey, Ill.
- \*Charter Gas Eng. Co., Sterling, Ill.
- \*Chicago Pneum. Tool Co., N. Y.
- \*Cushman Motor Wks., Lincoln, Neb.
- \*Electric Wheel Co., Quincy, Ill.
- \*Evinrude Motor Co., Milwaukee.
- \*Fairbanks, Morse & Co., Chicago.
- \*Foss Gas Eng. Co., Springfield, O.
- \*Fuller & Johnson Mfg. Co., Madison, Wis.
- \*Hinkley Motors, Inc., Detroit.
- \*Ingersoll-Rand Co., New York.
- \*Minneapolis Steel & Machy. Co., Minneapolis, Minn.
- \*Sanderson-Cyclone Drill Co., Orrville, O.
- \*Serrval Mfg. Co., Evansville, Ind.
- \*Sterling Eng. Co., Buffalo, N. Y.
- \*Universal Motor Co., Oshkosh, Wis.
- \*Weber Engine Co., Kansas City, Mo.
- \*Wisconsin Motor Mfg. Co., Milwaukee.
- \*Worthington Pump & Machy. Corp., N.Y.

## ENGINES, HOISTING (See Hoists)

## ENGINES, INDUSTRIAL (See Power Plants, Industrial)

## ENGINES, KEROSENE

- \*Alamo Eng. Co., Hillsdale, Mich.
- \*Climax Eng. Co., Clinton, Ia.
- \*Hercules Motors Corp., Canton, O.
- \*John Lanson Mfg. Co., New Holstein, Wis.
- \*Stover Mfg. & Eng. Co., Freeport, Ill.
- \*Waukesha Motor Co., Waukesha, Wis.
- \*Electric Wheel Co., Quincy, Ill.
- \*Fuller & Johnson Mfg. Co., Madison, Wis.
- \*Int'l Harvester Co. of Am., Chicago.

## ENGINES, OIL

### DIESEL

- \*F. Van Rossen Hoogendyk, New York.
- \*Allis-Chalmers Mfg. Co., Milwaukee.
- \*Bethlehem St. Co., Bethlehem, Pa.
- \*Busch-Sulzer Bros.-Deisel Eng. Co., St. Louis.
- \*Fairbanks, Morse & Co., Chicago.
- \*Fulton Iron Wks. Co., St. Louis.
- \*McIntosh & Seymour Corp., Auburn, N.Y.
- \*New London Ship & Eng. Co., Groton, Ct.
- \*Nordberg Mfg. Co., Milwaukee, Wis.
- \*St. Mary's Oil Eng. Co., St. Charles, Mo.
- \*Western Machy. Co., Los Angeles, Cal.

### SEMI-DIESEL

- \*Stover Mfg. & Eng. Co., Freeport, Ill.
- \*Anderson Engine & Fdry. Co., Anderson, Ind.
- \*Beaume Gas Eng. Co., Grove City, Pa.
- \*Buckeye Machinery Co., Lima, O.
- \*Charter Gas Eng. Co., Sterling, Ill.
- \*Chicago Pneum. Tool Co., N. Y.
- \*De La Vergne Mach. Co., N. Y.
- \*Fairbanks, Morse & Co., Chicago.
- \*Foss Gas Eng. Co., Springfield, O.
- \*Ingersoll-Rand Co., N. Y.
- \*Lombard Eng. Co., Ashland, Mass.
- \*Muncie Oil Gas Co., Muncie, Ind.
- \*Taylor Mach. Co., Cleveland, O.
- \*Weber Eng. Co., Kansas City, Mo.
- \*Worthington Pump & Machy. Corp., N.Y.

## ENGINES, PUMPING

- \*Climax Eng. Co., Clinton, Ia.
- \*Hercules Motors Corp., Canton, O.
- \*Stover Mfg. & Eng. Co., Freeport, Ill.
- \*Waukesha Motor Co., Waukesha, Wis.
- \*Allis-Chalmers Mfg. Co., Milwaukee.
- \*Hooven, Owens, Rentschler Co., Hamilton, O.
- \*Murray Iron Wks., Burlington, Ia.
- \*Nordberg Mfg. Co., Milwaukee.
- \*Worthington Pump & Machy. Corp., N.Y.

## ENGINES, SWINGING

- \*Mundy Sales Corp., N. Y.
- \*Dake Eng. Co., Grand Haven, Mich.
- \*Lidgerwood Mfg. Co., N. Y.

## EXCAVATING MACHINERY (See Names Under Excavators, also Steam Shovels)

### EXCAVATORS, CABLEWAY

- \*Erted Machy., Mfg. Co., Portland, Ore.
- \*Link-Belt Co., Chicago.
- \*Sauerman Bros., Inc., Chicago.
- \*R. H. Beaumont Co., Philadelphia
- \*Lidgerwood Mfg. Co., N. Y.
- \*Street Bros. Mach. Wks., Chattanooga.

### EXCAVATORS, CRAWLING TRACTOR

- \*Erie Steam Shovel Co., Erie, Pa.
- \*Thew Shovel Co., Lorain, O.
- \*Byers Mach. Co., Ravenna, Ohio.

### EXCAVATORS, DITCH AND TRENCH

- \*Barber-Greene Co., Aurora, Ill.
- \*Bay City Dredge Wks., Bay City, Mich.
- \*Buckeye Trac. Ditcher Co., Findlay, O.
- \*Erie Steam Shovel Co., Erie, Pa.
- \*Erted Machy., Mfg. Co., Portland, Ore.
- \*Innsley Mfg. Co., Indianapolis, Ind.
- \*Keystone Driller Co., Beaver Falls, Pa.
- \*Link-Belt Co., Chicago.
- \*Orton Crane & Shovel Co., Chicago.
- \*Parsons Co., Newton, Ia.
- \*Russell Grader Mfg. Co., Minneapolis
- \*Speeder Machy. Corp., Cedar Rapids, Ia.
- \*Star Drilling Mach. Co., Akron, O.
- \*Thew Shovel Co., Lorain, O.
- \*Austin Mach. Corp., Muskegon, Mich.
- \*Brown Htg. Machy. Co., Cleveland.
- \*Byers Mach. Co., Ravenna, Ohio.
- \*Cleveland Trencher Co., Euclid, O.
- \*Economy Exc. Co., Iowa Falls, Ia.
- \*Harward Co., N. Y.
- \*Lidgerwood Mfg. Co., N. Y.
- \*Marion Steam Shovel Co., Marion, O.
- \*Monaghan Mach. Co., Chicago.
- \*Moore Speeder Crane Co., Chicago, Ill.
- \*Osgood Co., Marion, O.
- \*Owensboro Ditcher & Grader Co., Owensboro, Ky.
- \*Street Bros. Mach. Wks., Chattanooga.
- \*C. T. Topping Machy. Co., Dayton, O.

### EXCAVATORS, DRAG-LINE

- \*Bay City Dredge Wks., Bay City, Mich.
- \*Erie Steam Shovel Co., Erie, Pa.
- \*Erted Machy., Mfg. Co., Portland, Ore.
- \*Gallon Ir. Wks. & Mfg. Co., Gallon, O.
- \*Koching Co., Milwaukee.
- \*Link-Belt Co., Chicago.
- \*Orton Crane & Shovel Co., Chicago.
- \*Russell Grader Mfg. Co., Minneapolis.
- \*Sauerman Bros., Chicago.
- \*Speeder Machy. Corp., Cedar Rapids, Ia.
- \*Star Drilling Mach. Co., Akron, O.
- \*Thew Shovel Co., Lorain, O.
- \*Amer. Hat. & Derrick Co., St. Paul.
- \*Austin Machy. Corp., Muskegon, Mich.
- \*Brown Htg. Machy. Co., Cleveland, O.
- \*Browning Crane Co., Cleveland, O.
- \*Bueyrus Co., So. Milwaukee, Wis.
- \*Byers Mach. Co., Ravenna, Ohio.
- \*Economy Exc. Co., Iowa Falls, Ia.
- \*C. L. Gade, Iowa Falls, Ia.
- \*Harnischfeger Corp., Milwaukee, Wis.
- \*Hayward Co., N. Y.
- \*Industrial Wks., Bay City, Mich.
- \*Lidgerwood Mfg. Co., N. Y.
- \*Marion Steam Shovel Co., Marion, O.
- \*Monaghan Mach. Co., Chicago.
- \*Moore Speeder Crane Co., Chicago.
- \*Osgood Co., Marion, O.

## Page Eng. Co., Chicago

## Street Bros. Mach. Wks., Chattanooga

### EXPANDED METAL

- \*Truscon Steel Co., Youngstown, O.
- \*Consolidated Exp. Metal Co., Wheeling, W. Va.
- \*Northwestern Exp. Metal Co., Chicago.
- \*Youngtown Pressed St. Co., Warren, O.

### EXPANSION JOINT MATERIAL

- \*Barber Asphalt Co., Philadelphia.
- \*Barrett Co., N. Y.
- \*Philip Carey Co., Cincinnati, O.
- \*W. H. Meadows, Inc., Rigin, Ill.
- \*Truscon Steel Co., Youngstown, O.
- \*Hoosier Asph. Co., Alexandria, Ind.
- \*Pioneer Asph. Co., Lawrenceville, Ill.
- \*Servicised Products Corp., Chicago.
- \*Texas Co., N. Y.
- \*Waring-Underwood Co., Philadelphia.

### EXPLOSIVES

- \*Atlas Powder Co., Wilmington, Del.
- \*E. I. Du Pont de Nemours & Co., Wilmington, Del.
- \*Giant Powder Co., S. Francisco, Cal.
- \*Grasselli Powder Co., Cleveland, O.
- \*Hercules Powder Co., Wilmington, Del.

### EXTENSION FRAMES, FORD TRUCK

### Swedish Crucible Steel Co., Detroit.

### FENCING

- \*American Steel & Wire Co., Chicago.
- \*Van Dorn Iron Wks. Co., Cleveland, O.
- \*Adrian Wire Fence Co., Adrian, Mich.
- \*Amer. Fence & Const. Co., New York.
- \*Anchor Post Fence Co., N. Y.
- \*Cyclone Fence Co., Waukegan, Ill.
- \*Dwiggins Wire Fence Co., Anderson, Ind.
- \*Ill. Wire & Mfg. Co., Joliet, Ill.
- \*Ind. Steel & Wire Co., Muncie, Ind.
- \*Interlocking Fence Co., Morton, Ill.
- \*Keystone Stil. & Wire Co., Peoria, Ill.
- \*Kokomo Stil. & Wire Co., Kokomo, Ind.
- \*Nitselman Bros., Muncie, Ind.
- \*Mich. Wire Fence Co., Adrian, Mich.
- \*Page Stil. & Wire Prod. Corp., Bridgeport, Conn.
- \*Pittsburgh Steel Co., Pittsburgh, Pa.
- \*Stewart Ir. Wks. Co., Cincinnati, O.
- \*Tex. Cyclone Fence Co., Ft. Worth, Tex.
- \*Wayne Iron Wks., Wayne, Pa.
- \*Wickwire-Spencer Steel Co., N. Y.

### FILING EQUIPMENT, STEEL

- \*Van Dorn Iron Wks. Co., Cleveland, O.
- \*Art Metal Constr. Co., Jamestown, N.Y.
- \*Berger Mfg. Co., Canton, O.
- \*Canton Art Metal Co., Canton.
- \*Gen. Fireproofing Co., Youngstown, O.

### FILTERS, OIL

- \*S. F. Bowser & Co., Inc., Ft. Wayne, Ind.

### FILTERS, WATER

- \*Amer. Water Softener Co., Phila., Pa.
- \*Cochrane Corp., Phila.
- \*Graver Corporation, E. Chicago, Ind.
- \*International Filter Co., Chicago.
- \*Norwood Eng. Co., Florence, Mass.
- \*Roberts Filter Co., Darby, Pa.
- \*W. B. Seale & Sons, Pittsburgh, Pa.

### FINISHING MACHINES, CONCRETE

### ROAD (See Concrete Road Finishers)

### FIRE & POLICE ALARM SYSTEMS

- \*Gamewell Co., Newton Upper Falls, Mass.
- \*Harrington-Seaberg Corp., Moline, Ill.
- \*Sterling Siren Fire Alarm Co., Rochester, N. Y.

### FIRE ALARM SIRENS

- \*Union Water Meter Co., Worcester, Mass.
- \*Erick Elec. Siren Co., St. Paul, Minn.
- \*Federal Sign System, Chicago.
- \*Hendrie & Bolthoff Mfg. & Sup. Co., Denver, Colo.
- \*Holtsner-Cabot Elec. Co., Boston
- \*Sterling Siren Fire Alarm Co., Rochester, N. Y.

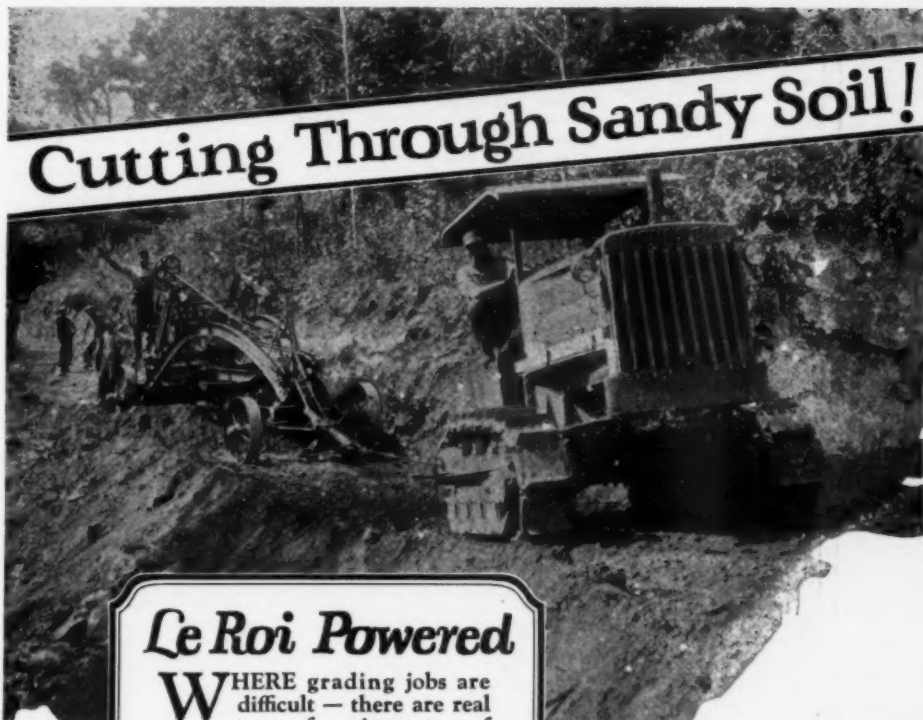
### FIRE APPARATUS, MOTOR

- \*Mack Trucks, Inc., N. Y.
- \*Ahrens-Fox Fire Eng. Co., Cincinnati, O.

If you find any errors or omissions in this Where to Purchase list, please send corrections to

CONTRACTORS AND ENGINEERS MONTHLY

# Cutting Through Sandy Soil!



## Le Roi Powered

**W**HERE grading jobs are difficult — there are real tests of equipment — of heavy duty power.

The above is typical of this work — shows a Le Roi powered tractor cutting and grading sandy soil. Pulling through spots where footing is hard to get — yet where the blade needs more than average power.

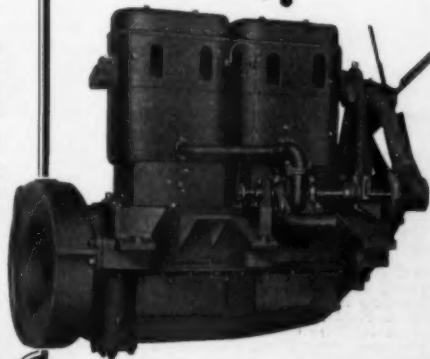
Le Roi Industrial Engines do the toughest of construction work. They are preferred because they give smoother power — more economical power — surplus power.

For greater flexibility, greater acceleration, less vibration at lowest costs, specify Le Roi engines on your equipment.

LE ROI COMPANY  
Milwaukee, Wis.

**LE ROI ENGINES**  
**3 to 160 HORSE POWER**

ENGINE  
BUILDERS  
only!



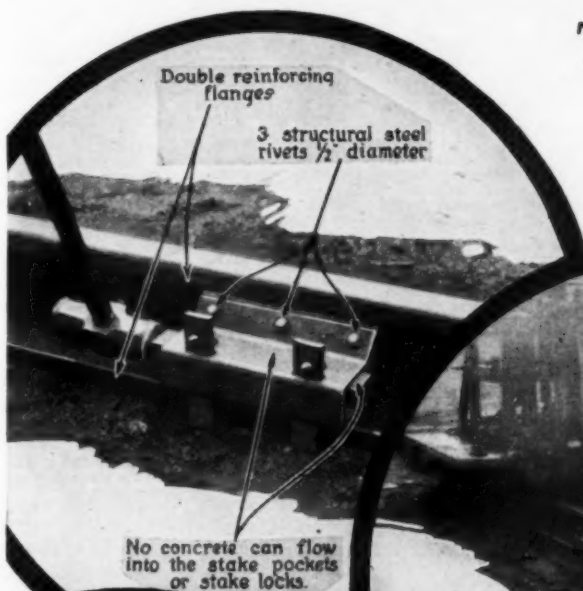
# Where to Purchase

- American-La France Fire Eng. Co.**, Elmira, N. Y.  
**Boyer Fire App. Co.**, Logansport, Ind.  
**Brookway Motor Fire App. Co.**, Cortlandt, N. Y.  
**Buffalo Fire Appl. Corp.**, Buffalo, N. Y.  
**Foamite-Childs Corp.**, Utica, N. Y.  
**Hale Fire Pump Co.**, Conshohocken, Pa.  
**Jaeger Portable Power Corp.**, Detroit  
**Northern Fire Apparatus Co.**, Minneapolis, Minn.  
**Peter Pirsch & Sons Co.**, Kenosha, Wis.  
**Prospect Fire Engine Co.**, Prospect, O.  
**Seagrave Co.**, Columbus, O.  
**Stats Fire Eng. Co.**, Indianapolis, Ind.  
**Waterous Fire Eng. Wks.**, St. Paul, Minn.  
**White Co.**, Cleveland
- FIRE EXTINGUISHERS, CHEMICAL**  
**American-LaFrance Fire Eng. Co.**, Elmira, N. Y.  
**Buffalo Fire App. Corp.**, Buffalo, N. Y.  
**Foamite-Childs Corp.**, Utica, N. Y.  
**Pyrene Mfg. Co.**, Newark, N. J.
- FIRE HOSE (See Hoses, Fire)**
- FIRST AID EQUIPMENT**  
**American-La France Fire Engine Co.**, Elmira, N. Y.
- FITTINGS, ACID RESISTING**  
**Barber Asphalt Co.**, Philadelphia.
- FLEXIBLE JOINTS**  
**Central Foundry Co.**, N. Y.  
**U. S. C. I. Pipe & Fdry. Co.**, Burlington, N. J.  
**Coldwell-Wilcox Co.**, Newburgh, N. Y.  
**Crane Co.**, Chicago.  
**United Lead Company**, N. Y.
- FLOOD LIGHTING PROJECTORS**  
**General Electric Co.**, Schenectady.
- FLOORING, COMPOSITION**  
**Barber Asphalt Co.**, Phila., Pa.  
**Barrett Co.**, N. Y.  
**Am. Mason Safety Tr. Co.**, Lowell, Mass.  
**Johns-Manville, Inc.**, N. Y.  
**Marine Decking & Sup. Co.**, Phila., Pa.  
**Franklyn R. Muller & Co.**, Waukegan, Ill.
- FLOORS, WOOD BLOCK**  
**Barrett Co.**, N. Y.  
**Carter Bloxmond Flooring Co.**, Kansas City, Mo.  
**Jennison-Wright Co.**, Toledo, O.  
**Midland Creos. Co.**, Toledo, O.  
**Republic Creos. Co.**, Indianapolis, Ind.  
**Sou. Wood Preserving Co.**, Atlanta, Ga.  
**Wyckoff Pipe & Creos. Co.**, N. Y.
- FLUSH TANKS**  
**Pacific Flush Tank Co.**, Chicago & N. Y.
- FLUSHERS, STREET (See Street Flushers and Sprinklers)**
- FORGES**  
**Buffalo Forge Co.**, Buffalo, N. Y.  
**Hauck Mfg. Co.**, B'klyn, N. Y.
- FORGES, OIL (Rivet Heating)**  
**Mead-Morrison Mfg. Co.**, E. Boston  
**Hauck Mfg. Co.**, B'klyn, N. Y.
- FORM CLAMPS**  
**Inley Mfg. Co.**, Indianapolis, Ind.  
**Williams Natl. Form Clamp Co.**, Chicago.  
**W. A. Kuhlman & Co.**, Toledo, O.  
**M. & M. Wire Clamp Co.**, Minneapolis.  
**Universal Form Clamp Co.**, Chicago.
- FORMS, CONCRETE**  
**Blaw-Knox Co.**, Pittsburgh, Pa.  
**Helsel P'l. Form & Ir. Co.**, Warren, O.  
**Lakewood Eng. Co.**, Cleveland, O.  
**Truscon Steel Co.**, Youngstown, O.  
**Concrete Form Co., Inc.**, Syracuse, N.Y.
- Hotchkiss Sil. Products Co.**, Binghamton, N. Y.  
**Metal Forms Corp.**, Milwaukee.
- FORMS, MANHOLE, PIPE, SEWER, ETC**  
**Helsel Stl. Form & Ir. Co.**, Warren, O.
- FORMGRADERS**  
**Ted Carr & Co.**, Chicago
- FOUNTAINS, DRINKING**  
**Casey-Hedges Co.**, Chattanooga, Tenn.  
**Jas. B. Clow & Sons**, Chicago.  
**Orane Co.**, Chicago.  
**J. L. Mott Iron Wks.**, New York  
**Murdock Mfg. & Sup. Co.**, Cincinnati.  
**Puro San. Dr. Fin. Co.**, Haydenville, Mass.  
**Rundie-Spence Mfg. Co.**, Milwaukee.  
**Stewart Iron Wks. Co.**, Cincinnati, O.  
**Halsey W. Taylor Co.**, Warren, O.  
**Century Brass Wks.**, Belleville, Ill.
- FULL CRAWLERS**  
**Trackson Co.**, Milwaukee
- FURNITURE AND FILES, STEEL**  
**Van Dorn Iron Wks. Co.**, Cleveland, O.  
**Art Metal Const. Co.**, Jamestown, N. Y.  
**Canton Art Metal Co.**, Canton.  
**Gen. Fireproofing Co.**, Youngstown, O.
- FURRING AND SLEEPER ANCHORS**  
**Dayton Sure Grip & Shore Co.**, Dayton, O.
- GARBAGE CANS (See Cans)**
- GARBAGE DISPOSAL SYSTEMS**  
**American Beccari Corp.**, N. Y.  
**C. O. Bartlett & Snow Co.**, Cleveland, O.  
**Decarie Incinerator Co.**, L. I. C., N. Y.  
**Goder Incinerator Corp.**, Chicago.  
**Hiler Eng. & Const. Co.**, B'klyn, N. Y.  
**Midwest Incinerator Co.**, Chicago.  
**Morse-Boulger Destructor Co.**, N. Y.  
**Nye Odorous Crematory Co.**, Macon, Ga.  
**Pittsburgh-Des Moines Steel Co.**, Pittsburgh, Pa.
- GARBAGE TRAILERS AND BODIES**  
**Hell Co.**, Milwaukee.  
**Highway Trailer Co.**, Edgerton, Wis.  
**Littleford Bros.**, Cincinnati.  
**Atia Corp.**, New York.  
**Detroit Trailer & Mach. Co.**, Detroit.  
**Lee Trailer & Body Co.**, Plymouth, Ind.  
**Troy Trailer & Wagon Co.**, Troy, O.
- GARBAGE TRUCKS**  
**Hell Co.**, Milwaukee, Wis.  
**Geo. H. Holabog & Bro.**, Jeffersonville, Ind.  
**Lee Trailer & Body Co.**, Plymouth, Ind.  
**Rex-Watson Corp.**, Canastota, N. Y.
- GAS METERS (See Meters, Gas)**
- GAS PRODUCERS**  
**Westinghouse Elec. & Mfg. Co.**, E. Pittsburgh, Pa.  
**R. D. Wood & Co.**, Phila., Pa.
- GASOLINE STORAGE TANKS**  
**Hell Co.**, Milwaukee, Wis.  
**Littleford Bros.**, Cincinnati, O.  
**Biggs Boiler Works**, Akron, O.  
**Birmingham Tank Co.**, Birmingham, Ala.  
**S. F. Bowser & Co., Inc.**, Ft. Wayne, Ind.  
**Chicago Bridge & Iron Wks.**, Chicago.  
**Graver Corp.**, E. Chicago, Ind.  
**Wm. B. Scalf & Sons**, Pittsburgh, Pa.  
**Tekhelm Oil Tank & Pump Co.**, Ft. Wayne, Ind.  
**United Iron Wks. Inc.**, K. City, Mo.  
**Wayne Co.**, Ft. Wayne, Ind.
- GATES, SLUICE**  
**Chapman Valve Mfg. Co.**, Indian Orchard, Mass.  
**Coffin Valve Co.**, Boston, Mass.  
**Coldwell-Wilcox Co.**, Newburgh, N. Y.  
**R. Hardisty Mfg. Co.**, Denver.  
**Ladlow Valve Mfg. Co.**, Troy, N. Y.
- GATES FOR PARKS AND CEMENTERIES**  
**Stewart Iron Wks. Co.**, Cincinnati, O.  
**Wayne Iron Wks.**, Wayne, Pa.
- GAUGES, WATER**  
**Bristol Co.**, Waterbury, Conn.  
**Lenkenheimer Co.**, Cincinnati, O.  
**Walworth Mfg. Co.**, Boston.
- GAUGES, SURFACE, RESERVOIR AND SPECIAL WATER-WORKS**  
**Builders Iron Fdry.**, Providence, R. I.  
**Simplex Valve & Meter Co.**, Phila., Pa.
- GENERATOR SETS**  
**Climax Eng. Co.**, Clinton, Iowa.  
**Cook Motor Co.**, Delaware, O.  
**Carbic Mfg. Co.**, Duluth.
- GLASS, FIREPROOF (See Wire Glass)**
- GOVERNORS, GASOLINE ENGINE**  
**Gardner-Denver Co.**, Denver, Col.  
**Pickering Governor Co.**, Portland, Ct.
- GRADERS, ROAD (See Road Graders)**
- GRADER, BLADES**  
**Gallon Ir. Wks. & Mfg. Co.**, Gallon, O.  
**Russell Grader Mfg. Co.**, Minneapolis.  
**J. D. Adams & Co.**, Indianapolis, Ind.  
**Shunk Mfg. Co.**, Bucyrus, O.
- GRAND STANDS, PORTABLE**  
**Circle A. Prod. Corp.**, Newcastle, Ind.  
**Leavitt Mfg. Co.**, Urbana, Ill.  
**Wayne Iron Wks.**, Wayne, Pa.
- GRATING, STEEL**  
**Blaw-Knox Co.**, Pittsburgh.
- GREASE**  
**Dixey, Inc.**, St. Louis.
- GRINDERS**  
**Chicago Pneum. Tool Co.**, N. Y.  
**Cleveland Pneum. Tool Co.**, Cleveland, O.  
**Ingersoll-Rand Co.**, N. Y.
- GRIZZLIES**  
**Smith Engineering Works**, Milwaukee  
**Allis-Chalmers Mfg. Co.**, Milwaukee  
**Austin Mfg. Co.**, Chicago.  
**Robins Conv. Belt Co.**, New York  
**Stephens-Adams Mfg. Co.**, Angora, Ill.
- GUARDS, ROAD & HIGHWAY**  
**Am. Steel & Wire Co.**, Chicago.  
**Williamsport Wire Rope Co.**, Williamsport, Pa.  
**Cyclone Fence Co.**, Waukegan, Ill.  
**Hazard Mfg. Co.**, Wilkesbarre, Pa.  
**Stewart Iron Wks. Co.**, Cincinnati.  
**Wickwire-Spencer Steel Co.**, N. Y.
- GYPSPUM PRODUCTS**  
**U. S. Gypsum Co.**, Chicago.  
**Fenton Mfg. Co.**, Cleveland, O.
- HAMMERS, STEAM, PILE (See Pile Hammers, Steam)**
- HEAT INSULATING MATERIAL**  
**Philip Carey Co.**, Cincinnati, O.  
**Johns-Manville, Inc.**, N. Y.
- HEATING KETTLES (See Kettles)**
- HIGHWAY MOWERS**  
**Rawls Mfg. Co.**, Chicago.
- HITCHES**  
**Gustav Schaefer Wagon Co.**, Cleveland, O.  
**Trail-It Co.**, St. Paul.  
**Whitehead & Kales Co.**, Detroit.  
**Detroit Trailer & Mach. Co.**, Detroit.  
**Fenton Mfg. Co.**, Cleveland, O.
- HOISTS, AUTOMATIC**  
**Zetterlund Hat. & Mch. Co.**, Milwaukee.
- HOISTS, BELT-DRIVEN**  
**Amer. Saw Mill Mch. Co.**, Hackettstown, N. J.  
**Dobbie Fdry. & Mach. Co.**, Niagara Falls.  
**Domestic Engine & Pump Co.**, Shippensburg, Pa.  
**Mead-Morrison Mfg. Co.**, E. Boston, Mass.  
**Mundy Sales Corp.**, N. Y.

\* Indicates that the manufacturer carries an advertisement. See index facing inside back cover.\*



# The Road Form That Is a Road Form



No concrete can flow into the stake pockets or stake locks.



STAKES ONLY  
6 INCHES APART  
CENTER TO CENTER



HEAD OF JOINT  
FITS SNUG UNDER TREAD  
OF RAIL, PREVENTING ANY  
DEFLECTION



Write for this  
Catalog of HELTZEL  
Steel Road Forms

Ask the man  
who inspects 'em—  
or the man  
who owns 'em—  
or the man  
who sets 'em—

**THE HELTZEL STEEL FORM & IRON CO., WARREN, OHIO**

Do you mention the CONTRACTORS AND ENGINEERS MONTHLY when writing? Please do.



# Where to Purchase

American Hoist & Derrick Co., St. Paul, Minn.  
Lidgerwood Manufacturing Co., N. Y.  
Street Bros. Mach. Wks., Chattanooga  
Weller Mfg. Co., Chicago.

## HOISTS, CONCRETE, TOWER

\*Domestic Eng. & Pump Co., Shippensburg, Pa.  
\*Insley Mfg. Co., Indianapolis, Ind.  
\*Lakewood Eng. Co., Cleveland, O.  
\*Mead-Morrison Mfg. Co., East Boston.  
\*Mundy Sales Corp., N. Y.  
\*Nove Engine Co., Lansing, Mich.  
\*Ransome Conc. Mch. Co., Dunellen, N. J.  
English Bros. Machy. Co., Kansas City.  
Lidgerwood Manufacturing Co., N. Y.  
Street Bros. Mach. Wks., Chattanooga.

## HOISTS, ELECTRIC

\*Clyde Iron Wks. Sales Co., Duluth, Minn.  
\*Debbie Fdry. & Mach. Co., Niagara Falls  
\*Domestic Eng. & Pump Co., Shippensburg, Pa.

\*S. Flory Mfg. Co., Bangor, Pa.  
\*Mead-Morrison Mfg. Co., E. Boston.  
\*Mundy Sales Corp., N. Y.  
\*Nove Engine Co., Lansing, Mich.  
\*O. K. Clutch & Mach. Co., Columbia, Pa.  
Am. Hoist & Derrick Co., St. Paul, Minn.  
Chisholm-Moore Co., Cleveland, O.  
Construction Machy. Co., Waterloo, Ia.  
Dake Eng. Co., Grand Haven, Mich.  
English Bros. Machy. Co., Kansas City.  
Harnischfeger Corp., Milwaukee.  
Lidgerwood Manufacturing Co., N. Y.  
Ntl. Hoisting Eng. Co., Harrison, N. J.  
Northern Eng. Wks., Detroit.  
Street Bros. Mach. Wks., Chattanooga.  
Thomas Elev. Co., Chicago.  
Treadwell Eng. Co., Easton, Pa.  
Vulcan Iron Wks., Wilkes-Barre, Pa.

## HOISTS, FORDSON

\*Clyde Ir. Wks. Sales Co., Duluth, Minn.  
\*Ersted Mach. Mfg. Co., Portland, Ore.  
Okla. Eng. & Fdry. Co., Muskogee, Okla.  
Otis Eng. Corp., N. Y.  
Sheffield Tool & Supply Co., Sheffield, Pa.

## HOISTS, GASOLINE

\*Amer. Saw Mill Mch. Co., Hackettstown, N. J.  
\*Clyde Iron Wks. Sales Co., Duluth, Minn.  
\*Domestic Eng. & Pump Co., Shippensburg, Pa.  
\*Ersted Mach. Mfg. Co., Portland, Ore.  
\*S. Flory Mfg. Co., Bangor, Pa.  
\*Mead-Morrison Mfg. Co., E. Boston.  
\*Mundy Sales Corp., N. Y.  
\*Nove Engine Co., Lansing, Mich.  
\*O. K. Clutch & Mach. Co., Columbia, Pa.  
\*Pioneer Tractors, Inc., Winona, Minn.  
Amer. Hoist & Der. Co., St. Paul, Minn.  
Amer. Mfg. & Eng. Co., Kalamazoo, Mich.  
Austin Mfg. Co., Chicago.  
Buffalo Hoist & Derrick Co., Buffalo, N. Y.  
C. H. & E. Mfg. Co., Milwaukee.  
Construction Machy. Co., Waterloo, Ia.  
Dake Eng. Co., Grand Haven, Mich.  
English Bros. Machy. Co., Kansas City.  
Lansing Co., Lansing, Mich.  
Lidgerwood Manufacturing Co., N. Y.  
Ntl. Hoisting Eng. Co., Harrison, N. J.  
Orr & Sombower, Reading, Pa.  
Street Bros. Mach. Wks., Chattanooga.  
Thomas Elevator Co., Chicago.

## HOISTS, PNEUMATIC

\*Gardner-Denver Co., Denver, Col.  
\*Mead-Morrison Mfg. Co., E. Boston.  
\*Sullivan Mch. Co., Chicago.  
Chicago Pneumatic Tool Co., N. Y.  
Curtis Pn. Mch. Co., St. Louis.  
Dake Engine Co., Grand Haven, Mich.  
Detroit Hoist & Mach. Co., Detroit.  
Gilman Mfg. Co., E. Boston, Mass.

Hanna Eng. Works, Chicago.  
Independent Pneum. Tool Co., Chicago.  
Ingersoll-Rand Co., N. Y.  
Northern Eng. Wks., Detroit, Mich.  
Worthington Pump & Mch. Corp., N. Y.

## HOISTS, STEAM

\*Clyde Iron Wks. Sales Co., Duluth, Minn.  
\*S. Flory Mfg. Co., Bangor, Pa.  
\*Mead-Morrison Mfg. Co., E. Boston.  
\*Mundy Sales Corp., N. Y.  
Amer. Hoist & Derrick Co., St. Paul, Minn.  
Dake Engine Co., Grand Haven, Mich.  
Hardie-Tynes Mfg. Co., Birmingham, Ala.  
Ingersoll-Rand Co., N. Y.  
Lidgerwood Manufacturing Co., N. Y.  
Ntl. Hoisting Eng. Co., Harrison, N. J.  
Orr & Sombower, Reading, Pa.  
Street Bros. Mach. Wks., Chattanooga.  
Thomas Elev. Co., Chicago.  
Treadwell Eng. Co., Easton, Pa.

## HOISTS FOR MOTOR TRUCKS

\*Hell Co., Milwaukee.  
\*Van Dorn Iron Wks., Cleveland, O.  
\*Wood Hydr. Hoist & Body Co., Detroit  
Atlas Corp., New York.  
Hydr. Hoist Mfg. Co., St. Paul, Minn.  
Joliet Mfg. Co., Joliet, Ill.  
Lidgerwood Manufacturing Co., N. Y.  
Rock Mfg. Co., Waterloo, N. Y.

## HOISTS, PORTABLE

\*Pioneer Tractors, Inc., Winona, Minn.  
Jas. B. Seaverns Co., Batavia, Ill.  
Joliet Mfg. Co., Joliet, Ill.

## HOPPERS, CONCRETE (Aggregate Measuring)

\*Heltzel St. Form & Ir. Co., Warren, O.  
\*Lakewood Eng. Co., Cleveland, O.  
\*Ransome Conc. Mch. Co., Dunellen, N. J.  
Rutley Rim Co., Waukegan, Wis.  
Jas. B. Seaverns Co., Batavia, Ill.

## HOSE, AIR

\*The Dallett Co., Phila., Pa.  
\*Hardsocg Wonder Dr. Co., Ottumwa, Ia.  
Chicago Pneumatic Tool Co., N. Y.  
Cincinnati Rubber Mfg. Co., Cincinnati.  
Cleveland Rock Drill Co., Cleveland, O.  
Gilman Mfg. Co., E. Boston, Mass.  
Goodyear Tire & Rubber Co., Akron, O.  
Ingersoll-Rand Co., N. Y.  
Mulconroy Co., Inc., Phila., Pa.  
Penns. Flexible Metallic Tubing Co., Phila., Pa.  
Republic Rubber Co., Youngstown, O.  
U. S. Rubber Co., N. Y.

## HOSE, FIRE

Bi-Lateral Fire Hose Co., Chicago.  
Eureka Fire Hose Mfg. Co., N. Y.  
Fabric Fire Hose Co., N. Y.  
B. F. Goodrich Rubber Co., Akron, O.  
Goodyear Tire & Rubber Co., Akron, O.

## HOUSE-MOVING EQUIPMENT

\*La Plant-Ghose Mfg. Co., Cedar Rapids, Ia.

## HOUSE NUMBERS

Hamilton Metal Prod. Co., Hamilton, O.  
C. H. Hanson Co., Chicago.  
Niagara Metal Stamping Corp., Niagara Falls, N. Y.

## HOUSES, PORTABLE (See Portable Buildings)

## HYDRANTS, FIRE

Chapman Valve Mfg. Co., Indian Orchard, Mass.  
Columbian Ir. Wks., Chatta., Tenn.  
Darling Valve & Mfg. Co., Williamsport, Pa.  
Eddy Valve & Mfg. Co., Waterford, N. Y.  
Iowa Valve Co., Oskaloosa, Ia.  
Kennedy Valve Mfg. Co., Elmira, N. Y.

Ludlow Valve Mfg. Co., Troy, N. Y.  
Norwood Eng. Co., Florence, Mass.  
Rensselaer Valve Co., Troy, N. Y.  
A. P. Smith Mfg. Co., E. Orange, N. J.  
Waterous Co., St. Paul  
R. D. Wood & Co., Phila., Pa.

## HYDRAULIC RAMS

Deming Co., Salem, O.  
Johnson Mfg. Co., Seattle, Wash.  
Rife Hydraulic Engine Co., N. Y.  
Rumsey Pump Co., Seneca Falls, N. Y.

## ICE-MAKING MACHINERY

Arctic Ice Mach. Co., Canton, O.  
Baker Ice Mach. Co., Omaha, Neb.  
Brunswick-Kroeschell Co., N. Brunswick, N. J.  
Carbondale Mach. Co., Carbondale, Pa.  
De La Vergne Mach. Co., N. Y.  
Frick Co., Inc., Waynesboro, Pa.  
Ingersoll-Rand Co., New York.  
Triumph Ice Mach. Co., Cincinnati, O.  
United Iron Wks., Inc., K. City, Mo.  
Vilter Mfg. Co., Milwaukee, Wis.  
Henry Vogt Mach. Co., Louisville, Ky.  
York Mfg. Co., York, Pa.

## IGNITION SYSTEMS

\*Eisemann Magneto Corp., New York  
American Bosch Magneto Corp., Springfield, Mass.  
Dayton Eng. Lab. Co., Dayton, O.  
Splittorf Electric Co., Newark, N. J.

## INCINERATORS, GARBAGE (See Garbage Disposal)

## INDICATOR POSTS (See Valves)

## INSPECTING LABORATORIES

\*Conard & Busby, Burlington, N. J.  
\*Pittsburgh Testing Lab., Pittsburgh.  
Allentown Testing Lab., Allentown, Pa.  
E. L. Conwell & Co., Phila., Pa.  
Gulick-Henderson Co., N. Y.  
Robert W. Hunt Co., Chicago.  
N. Y. Testing Lab., N. Y.

## INSTRUMENTS AND SUPPLIES (Surveyors' and Engineers')

Wm. Ainsworth & Sons, Denver, Col.  
L. Beckman Co., Toledo, O.  
C. L. Berger & Sons, Boston  
Brandis & Sons Mfg. Co., B'klyn N. Y.  
Buff & Buff Mfg. Co., Boston  
Eugene Dietzgen Co., Chicago  
W. & L. E. Gurley, Troy, N. Y.  
Keuffel & Esser Co., Hoboken, N. J.  
Kolesch & Co., New York.  
A. Lietz Co., San Francisco  
Leupold-Volpel & Co., Portland, Ore.  
Warren Knight Co., Phila., Pa.  
F. Weber & Co., Phila., Pa.  
David White Co., Milwaukee, Wis.

## INTEGRAL CURB AND BASE FORMS (See Forms, Concrete)

## IRON WORK, STRUCTURAL AND ORNAMENTAL (See Bridges and Buildings)

## JACKS, LIFTING

\*McKinnon-Terry Drill Co., N. Y.  
\*Templeton, Kenly & Co., Ltd., Chicago.  
Duff Mfg. Co., Pittsburgh, Pa.  
Joyce-Cridland Co., Dayton, O.  
A. O. Norton, Inc., Boston  
Oil Jack Co., N. Y.  
Rees Mfg. Co., Pittsburgh, Pa.  
Watson-Stillman Company, N. Y.

## JACKS, PIPE FORGING

Duff Mfg. Co., Pittsburgh, Pa.  
Easy Mfg. Co., Lincoln, Neb.

## JAIL AND PRISON WORK

\*Van Dorn Iron Wks. Co., Cleveland  
E. T. Barnum Iron Wks., Detroit  
Fries & Son Steel Const. & Eng. Co., Covington, Ky.

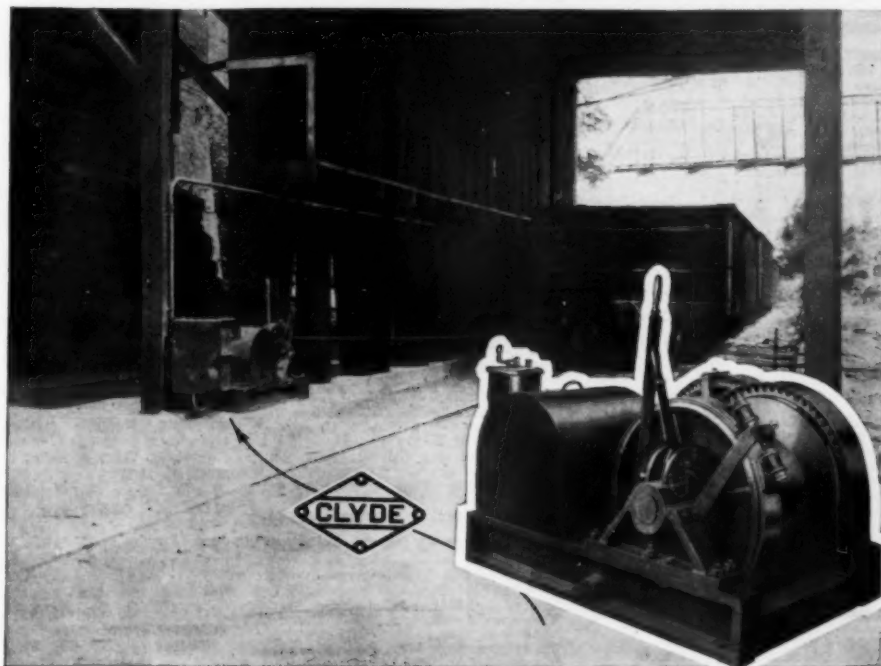
If you find any errors or omissions in this Where to Purchase list, please send corrections to  
CONTRACTORS AND ENGINEERS MONTHLY

# HOISTS CLYDE DERRICKS

The illustration gives an effective example of the use of the Clyde drum-type car puller. It is employed here by the Dubuque Stone Products Company, of Dubuque, Ia., for handling cars to and from a loading station.

The Clyde car puller does not require an experienced operator. It is carefully protected against weather, is simple, strong and safe to handle. Saves the time of a locomotive or a gang of laborers for spotting cars. Every factory of size, every grain elevator, every quarry and every gravel pit can make substantial savings with this Clyde outfit. Complete details on request.

*You'll Take Pride In Your Clyde!*



## CLYDE IRON WORKS SALES COMPANY

Sole Distributors for CLYDE IRON WORKS, Duluth, U. S. A.

*Stocks Carried in the Following Warehouses:*

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*Branch Offices:*

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69 Union Ave.

JACKSONVILLE  
112 West Adams St.

SAN FRANCISCO  
737 Monadnock Bldg.

Do you mention the CONTRACTORS AND ENGINEERS MONTHLY when writing? Please do.

# Where to Purchase

Pauly Jail Bldg. Co., St. Louis, Mo.  
Stewart Iron Wks. Co., Cincinnati, O.

## JOINTS, EXPANSION PAVING (See Expansion Joint Material)

## JOINTS, FLEXIBLE PIPE (See Flexible Joints)

## JOISTS, STEEL

\*Truscon Steel Co., Youngstown, O.  
Berger Mfg. Co., Canton, O.  
Genfire Steel Co., Youngstown, O.

## KETTLES, FOR ASPHALT AND TAR

\*Acme Rd. Mach. Co., Frankfort, N. Y.  
\*Aeroll Burner Co., West New York, N. J.  
\*Barber Asphalt Co., Phila., Pa.  
\*Canney & Co., Inc., Phila., Pa.  
\*Good Rds. Mch. Co., Kennett Sq., Pa.  
\*Jos. Honhorst Co., Cincinnati, O.  
\*Kinney Mfg. Co., Boston, Mass.  
\*Littleford Bros., Cincinnati, O.  
\*Spears-Wells Mch. Co., Oakland, Cal.  
\*Union Iron Works, Inc., Hoboken, N. J.  
Chase & Lyman, Boston, Mass.  
Chausse Oil Burner Co., Elkhart, Ind.  
Huck Mfg. Co., B'klyn, N. Y.  
Macloed Co., Cincinnati, O.  
G. L. Stuehner Jr. Wks., Inc., Long Island City, N. Y.  
Tarrant Mfg. Co., Saratoga Spgs., N. Y.  
Universal Rd. Mach. Co., Kingston, N. Y.

## LANTERNS, CONTRACTORS'

\*Alex. Milburn Co., Baltimore, Md.  
Defiance Lantern & Stamping Co., Rochester, N. Y.  
R. E. Dietz Co., N. Y.  
Economy Elec. Lantern Co., Chicago.  
Handian, Buck Mfg. Co., St. Louis.  
Star Headlight & Lantern Co., Rochester, N. Y.

## LATH, METAL

\*Truscon Steel Co., Youngstown, O.  
Berger Mfg. Co., Canton, O.  
Bostwick Steel Lath Co., Niles, O.  
Consolidated Expanded Metals Co., Wheeling, W. Va.  
Genfire Steel Co., Youngstown, O.  
Milwaukee Corr. Co., Milwaukee, Wis.  
Northwestern Exp. Metal Co., Chicago.  
Fenn. Metal Co., Boston, Mass.  
Sykes Metal Lath and Roofing Co., Niles, O.  
Youngstown Pressed Steel Co., Warren, O.

## LAWN MOWERS

\*Kinney Standards, Inc., B'klyn, N. Y.  
Chadborn & Coldwell Mfg. Co., New-Coldwell Lawn Mower Co., Newburgh, N. Y.  
Gilson Mfg. Co., Port Washington, Wis.  
Ideal Power Lawn Mower Co., Lansing, Mich.

Jacobsen Mfg. Co., Racine, Wis.  
Modern Mach. Wks., Milwaukee.  
Penna. Lawn Mower Wks., Phila., Pa.  
Phila. Lawn Mower Co., Phila., Pa.  
S. P. Townsend Co., Bloomfield, N. J.  
Worthington Mower Co., Stroudsburg, Pa.

## LAWN MOWER SHARPENERS

Fate-Root-Heath Co., Plymouth, G.

## LEADITE

The Leadite Co., Phila., Pa.

## LEAD-MELTING FURNACES

\*Aeroll Burner Co., West New York, N. J.  
\*Littleford Bros., Cincinnati, O.  
Canton Fry & Mch. Co., Canton, O.  
Chicago Flexible Shaft Co., Chicago.  
Hauk Mfg. Co., B'klyn, N. Y.  
A. P. Smith Mfg. Co., E. Orange, N. J.

## LETTERING GUIDES

Wood-Regan Inst. Co., So. Orange, N. J.

## LETTERS AND FIGURES, METAL

Niagara Metal Stamp Corp., Niagara Falls, N. Y.

## LIGHTS, CONTRACTORS'

\*Alex. Milburn Co., Baltimore, Md.  
General Elec. Co., Schenectady, N. Y.  
Carbie Mfg. Co., Duluth, Minn.  
Hauk Mfg. Co., B'klyn, N. Y.  
Macloed Co., Cincinnati, O.  
Prest-O-Lite Co., Inc., N. Y.

## LIGHTING STANDARDS (See Street Lamp Posts)

## LIQUID CHLORINE

Arnold, Hoffman & Co., Inc., N. Y.  
Electro Bleaching Gas Co., N. Y.  
Hooker Electrochemical Co., N. Y.  
Mathieson Alkali Works, Inc., N. Y.  
Penna. Salt Mfg. Co., Phila., Pa.

## LOADERS, GRAVEL, WAGON, CAR, ETC.

\*Barber-Greene Co., Aurora, Ill.  
\*Bay City Dredge Wks., Bay City, Mich.  
\*Erie Steam Shovel Co., Erie, Pa.  
\*Chicago Automatic Conv. Co., Chicago.  
\*F.S. Mfg. Co., New Holstein, Wis.  
\*Gallon Jr. Wks. & Mfg. Co., Gallon, O.  
\*Geo. Haiss Mfg. Co., N. Y.  
\*Helsel St. Form & Ir. Co., Warren, O.  
\*Link Belt Co., Chicago.  
\*Northern Conveyor Co., Janesville, Wis.  
\*Russell Grader Mfg. Co., Minneapolis.  
\*Sauermau Bros., Chicago.  
\*Spears-Wells Mch. Co., Oakland, Cal.  
\*Star Drilling Mach. Co., Akron, O.  
Bonney Supply Co., Inc., Rochester, N. Y.  
Brown Hoisting Mch. Co., Cleveland.  
Burch Corp'n., Crestline, O.  
Conant Mach. Co., Concord Junet, Mass.  
Fairfield Eng. Co., Marion, O.  
Gifford-Wood Co., Hudson, N. Y.  
Jeffrey Mfg. Co., Columbus, O.  
Kent Mach. Co., Kent, O.  
Hughes-Keenan Co., Mansfield, O.  
Lee Trailer & Body Co., Plymouth, Ind.  
Lesman Loader Mfg. Co., Des Moines, Ia.  
Logan Co., Louisville, Ky.  
Nelson Iron Wks., Passaic, N. J.  
New Holland Mch. Co., N. Holland, Pa.  
Portable Machinery Co., Clifton, N. J.  
H. B. Sackett Screen & Chute Co., Chicago.  
Specialty Eng. Co., Phila., Pa.  
Universal Rd. Mach. Co., Kingston, N. Y.  
Weller Mfg. Co., Chicago.

## LOCKERS, STEEL

Durand Steel Locker Co., Chicago.  
Hart & Hutchinson Co., N. Britain, Ct.  
Lyon Metallic Mfg. Co., Aurora, Ill.  
Fred. Medart Mfg. Co., St. Louis, Mo.

## LOCOMOTIVES, FOR CONTRACTORS, ETC.

\*Brookville Truck & Tractor Co., Brookville, Pa.  
\*Geo. D. Whitcomb Co., Rochelle, Ill.  
Baldwin Loc. Wks., Phila., Pa.  
Davenport Loc. Wks., Davenport, Ia.  
Fate-Root-Heath Co., Plymouth, O.  
Heisler Locomotive Wks., Erie, Pa.  
Mid-West Locomotive Wks., Cincinnati.  
Lima Loc. Wks., Lima, O.  
Milwaukee Loc. Mfg. Co., Milwaukee.  
Plymouth Loc. Wks., Plymouth, O.  
H. K. Porter Co., Pittsburgh, Pa.  
Vulcan Iron Wks., Wilkes-Barre, Pa.  
Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.

## LUBRICANTS

\*D-A Lubricant Co., Ind'p'l's, Ind.  
\*Dixoy Inc., St. Louis.  
Texaco Co., New York

## MANHOLE COVERS (See Castings)

## METAL LATH (See Lath)

## METAL ROOFING (See Roofing)

## METER BOXES

Builders Iron Foundry, Providence, R. I.  
H. W. Clark Co., Mattoon, Ill.  
Clarksville Fdry. & Mach. Co., Clarksville, Tenn.  
J. B. Clow & Sons, Chicago.  
Columbian Ir. Wks., Chattanooga, Tenn.  
Ford Meter Box Co., Wabash, Ind.  
Mueller Co., Decatur, Ill.  
J. S. Schofield's Sons Co., Macon, Ga.

## METER COUPLINGS

\*Neptune Meter Co., N. Y.  
\*Union Water Meter Co., Worcester, Mass.  
H. W. Clark Co., Mattoon, Ill.  
Ford Meter Box Co., Wabash, Ind.  
Hersey Mfg. Co., Boston, Mass.  
Mueller Co., Decatur, Ill.  
Pittsburgh Equitable Meter Co., Pittsburgh, Pa.

## METER TESTERS

\*Neptune Meter Co., N. Y.  
H. W. Clark Co., Mattoon, Ill.  
Ford Meter Box Co., Wabash, Ind.  
Mueller Co., Decatur, Ill.  
National Meter Co., N. Y.  
Pittsburgh Equitable Meter Co., Pittsburgh, Pa.

## METERS, ELECTRIC (WATTHOUR)

Duncan Elec. Mfg. Co., LaFayette, Ind.  
General Elec. Co., Schenectady, N. Y.  
Sangamo Elec. Co., Springfield, Ill.  
Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.

## METERS, GAS

American Meter Co., N. Y.  
Bailey Meter Co., Cleveland, O.  
Bailey Iron Fdry., Providence, R. I.  
Cleveland Gas Meter Co., Cleveland, O.  
Pittsburgh Equitable Meter Co., Pittsburgh, Pa.

## METERS, WATER, OIL & GASOLINE

\*Neptune Meter Co., N. Y.  
\*Union Water Meter Co., Worcester, Mass.  
Badger Meter Mfg. Co., Milwaukee.  
Buffalo Meter Co., Buffalo, N. Y.  
Federal Meter Corp'n., E. Orange, N. J.  
Gamon Meter Co., Newark, N. J.  
Hersey Mfg. Co., Boston, Mass.  
National Meter Co., N. Y.  
Pittsburgh Equitable Meter Co., Pittsburgh, Pa.  
Thomson Meter Corp., New York.  
Worthington Pump & Mch. Corp., N. Y.

## METERS, WATER (VENTURI TYPE)

Builders Iron Fdry., Providence, R. I.  
Simplex Valve & Meter Co., Phila., Pa.

## MICROMETERS

\*Lufkin Rule Co., Saginaw, Mich.

## MIXERS, CONCRETE (See Concrete Mixers)

## MIXERS, GROUT

\*Lakewood Eng. Co., Cleveland, O.  
\*T. L. Smith Co., Milwaukee, Wis.  
\*Union Iron Wks., Inc., Hoboken, N. J.  
Kent Mach. Co., Kent, O.

## MIXERS, HOT

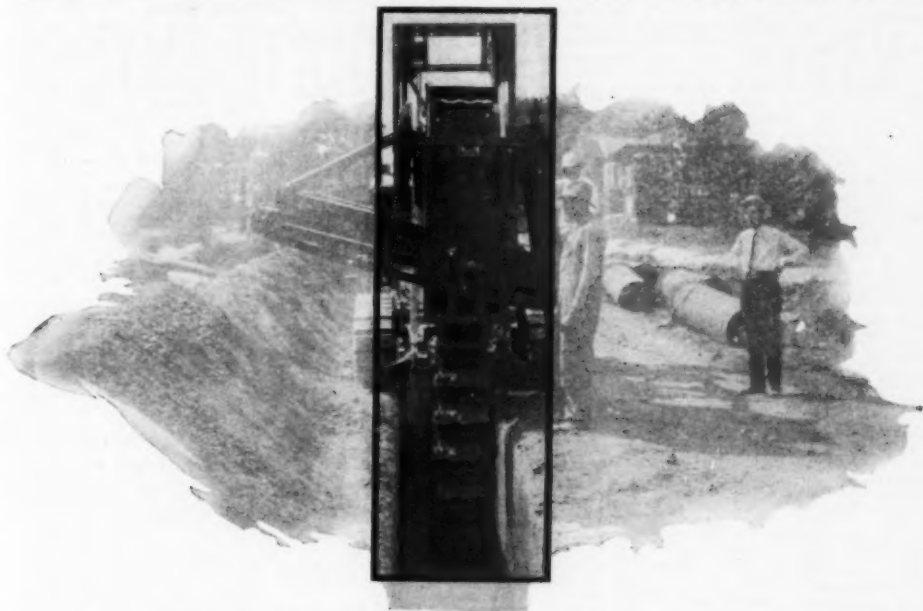
\*Barber Asphalt Co., Phila., Pa.

## MIXERS, MORTAR

\*Atlas Eng. Co., Milwaukee.  
\*Blaw-Knox Co., Pittsburgh, Pa.  
\*Blystone Mfg. Co., Cambridge Spgs., Pa.  
\*Helsel St. Form & Ir. Co., Warren, O.  
\*Jaeger Machine Co., Columbus, Ohio.  
\*Lakewood Eng. Co., Cleveland, O.  
\*Mell-Blumberg Co., New Holstein, Wis.  
\*Ransome Conc. Mch. Co., Dunellen, N. J.  
\*T. L. Smith Co., Milwaukee, Wis.  
\*Standard Scale & Supply Corp., Pittsburgh, Pa.  
Anchor Mfg. Co., Chicago

\* Indicates that the manufacturer carries an advertisement. See index facing inside back cover.\*

THE BARBER-GREENE IS THE ONLY DITCHER THAT DIGS STRAIGHT DOWN



## Digging a 30" Ditch with 21" Ditcher---at a Profit

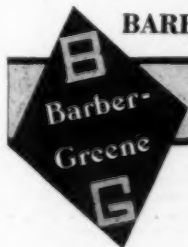
**I**T sounds like a tough problem. But this Barber-Greene had little trouble. It sailed through once in regular fashion. Then it came back and cut a second swath. And because it is so fast on its feet, it handled the job at a saving for the Birmingham Electric Co., Birmingham, Ala.

Add to such performance the nimbleness that cuts service laterals and stubs, the "milling action" digging that tears through coral rock, and such cost records as 4c to 6c per foot, and it is easy to see why Barber-Greene's lead all other ditchers in sales.

Now is the best time to send for your copy of "Ditching Snapshots and Records." This new book will give you all the dope with pictures and cold cost figures, on what Barber-Greene's are doing in every type of ditching. Drop us a card now. There's no obligation.



BARBER-GREENE COMPANY 485 W. PARK AVE., AURORA, ILLINOIS



## Barber-Greene Ditcher

Representatives in 50 Cities

DISC FEED LOADERS	VERTICAL BOOM DITCHERS
STANDARDIZED PORTABLE AND PERMANENT BELT CONVEYORS	CAR UNLOADERS
SNOW LOADERS	COAL LOADERS

Yes—we would like you to mention the CONTRACTORS AND ENGINEERS MONTHLY.



# Where to Purchase

Archer Iron Wks., Chicago.  
C. H. & E. Mfg. Co., Milwaukee, Wis.  
Construction Machy. Co., Waterloo, Ia.  
Kent Mach. Co., Kent, O.  
Kiel Mach. Co., Kiel, Wis.  
Knickerbocker Co., Jackson, Mich.  
Lansing Co., Lansing, Mich.  
Marsh-Capron Co., Chicago  
Talbot-Flood Mfg. Co., Kansas City, Mo.

## MIXERS, PAVING

\*Atlas Eng. Co., Milwaukee.  
\*Blystone Mfg. Co., Cambridge Spgs., Pa.  
\*Jaeger Machine Co., Columbus, Ohio  
\*Medli-Blumberg Co., New Holstein, Wis.  
\*Standard Scale & Supply Co., Pittsburgh  
Anchor Mfg. Co., Chicago.  
Essick & Co., Los Angeles, Cal.  
Knickerbocker Co., Jackson, Mich.  
Marsh-Capron Co., Chicago  
Talbot-Flood Mfg. Co., Kansas City, Mo.

## MORTAR BOXES

\*General Wheelbarrow Co., Akron, O.  
\*Holtzel Stl. Form & Ir. Co., Warren, O.  
\*Jos. Honhorst Co., Cincinnati, O.  
\*Littleford Bros., Cincinnati  
Anchor Mfg. Co., Chicago, Ill.  
Canton Art Metal Co., Canton, O.

## MORTISES, ELECTRIC

R. L. Carter Co., Phoenix, N. Y.  
Wappat Gear Wks., Pittsburgh.

## MOTORCYCLES

Cleveland Motorcycle Co., Cleveland, O.  
Excelsior Motor Mfg. & Supply Co., Chicago  
Harley-Davidson Motor Co., Milwaukee  
Indian Motorcycle Co., Springfield, Mass.

## MOTORS, ELECTRIC (See Electric Generators and Motors)

MOTORS, GASOLINE (See Engines, Gas and Gasoline)

## MOTOR TRUCKS

\*Graham Bros., Detroit  
\*Mack Trucks, Inc., New York  
Amer.-La France Fire Eng. Co., Elmira, N. Y.  
Acme Motor Truck Co., Cadillac, Mich.  
Atterbury Motor Car Co., Buffalo, N. Y.  
Autocar Co., Ardmore, Pa.  
Bessemer Motor Truck Co., Grove City, Pa.  
Brockway Motor Truck Co., Cortland, N. Y.  
Clydesdale Motor Truck Co., Clyde, O.  
Commerce Motor Trk. Co., Ypsilanti, Mich.  
Diamond T. Motor Car Co., Chicago  
Duplex Truck Co., Lansing, Mich.  
Federal Motor Truck Co., Detroit  
Ford Motor Co., Detroit  
Four Wheel Drive Auto Co., Clintonville, Wis.  
Garford Truck Co., Lima, O.  
General Motors Truck Co., Chicago.  
Gramm Motors, Inc., Lima, O.  
The Hug Co., Highland, Ill.  
Indiana Truck Corp., Marion, Ind.  
Int. Harvester Co., Chicago  
Kelly Springfield Truck & Bus Corp., Springfield, O.  
Larabee-Deyo Motor Tr. Co., Birmingham, N. Y.  
Luedinghaus-Eschenchied Wagon Co., St. Louis.  
Pierce-Arrow Motor Car Co., Buffalo  
Republic Truck Sales Corp., Alma, Mich.  
Relays Motor Corp., Wabash, Ind.  
Standard Motor Truck Co., Detroit  
Sterling Motor Truck Co., Milwaukee  
Stewart Motor Corp., Buffalo, N. Y.  
Toppins Trac. Truck Co., Appleton, Wis.  
Traffic Motor Tr. Co., St. Louis, Mo.  
United Motor Products Co., Grand Rapids, Mich.  
U. S. Motor Truck Co., Cincinnati, O.  
Walter Motor Truck Co., L. I. City, N. Y.  
White Co., Cleveland  
Yellow Truck & Coach Mfg. Co., Chicago

## MOULDS, CONCRETE

\*Blaw-Knox Co., Pittsburgh, Pa.  
\*Holtzel Stl. Form & Ir. Co., Warren, O.

## MUCKING MACHINES

Hoar Shovel Co., Duluth, Minn.

## NUMBERS, HOUSE (See House Numbers)

## OAKUM

Oxweld Acetylene Co., Long Island City, N. Y.

## OILS, ROAD

\*Barber Asphalt Co., Phila., Pa.  
\*Barrett Co., N. Y.  
\*Standard Oil Co. (Indiana), Chicago  
\*Standard Oil Co. (N. Y.), N. Y.  
Atl. Ref. & Asph. Corp., Phila., Pa.  
Headley Good Roads Co., Phila., Pa.  
Pioneer Asph. Co., Lawrenceville, Ill.  
Standard Oil Co. (La.), N. Orleans, La.  
Standard Oil Co. (N. J.), Newark, N. J.  
Texas Company, N. Y.

## OKY-ACETYLENE APPARATUS

\*Alex. Milburn Co., Baltimore, Md.  
Carbic Mfg. Co., Duluth.  
Oxweld Acetylene Co., Long Island City, N. Y.

## PACKING, WATER PIPE

The Leadite Co., Phila., Pa.  
United Lead Company, N. Y.

## PAINTING MACHINERY

\*Alex. Milburn Co., Baltimore, Md.  
Binks Spray Eq. Co., Chicago  
Chicago Pneum. Tool Co., New York  
De Vilbiss Mfg. Co., Toledo, O.  
Eclipse Air Brush Co., Newark, N. J.  
W. N. Matthews Corp., St. Louis  
Pasche Air Brush Co., Chicago  
Simons' Airt Spray Brush Co., Dayton, O.  
Spraco Painting Equip. Co., Boston

## PAINTS, METAL PROTECTION

\*Barber Asphalt Co., Phila., Pa.  
\*Barrett Co., N. Y.  
\*Phillip Carey Co., Cincinnati, O.  
\*Jos. Dixon Crucible Co., J. City, N. J.  
Acme White Ld. & Col. Wks., Detroit  
Berry Bros., Detroit  
Cook Paint & Varnish Co., K. City, Mo.  
Detroit Graphite Co., Detroit  
Detroit White Lead Wks., Detroit  
E. I. Du Pont de Nemours & Co., Inc., Wilmington, Del.  
Euclid Chemical Co., Cleveland, O.  
Minwax Co., N. Y.  
Protexol Corp., Kenilworth, N. J.  
Ruberoid Co., N. Y.  
Semet-Solvay Co., N. Y.  
Servicised Products Corp'n., Chicago  
Sherwin-Williams Co., Cleveland, O.  
L. Sonneborn Sons, N. Y.  
Tech Bros., N. Y.  
Tropical Paint & Oil Co., Cleveland, O.  
Truscon Laboratories, Detroit

## PAPERS, BLUE PRINT

Ind'p'l's Blue Print & Supply Co., Ind'p'l's, Ind.

## PARK BENCHES

\*Van Dorn Iron Wks. Co., Cleveland  
Bausman Mfg. Co., Millersville, Pa.  
Logan Co., Louisville, Ky.  
Fred J. Meyers Mfg. Co., Hamilton, O.  
Stewart Iron Wks. Co., Cincinnati, O.

## PAVEMENT BREAKERS (See Breakers)

## PAVING AND ROAD ROLLERS. (See Road and Paving Rollers)

## PAVING BLOCKS, CREOSOTED WOOD. (See Creosoted Blocks)

## PAVING BRICK

Alton Brick Co., Alton, Ill.  
Buckeye Shale Brick Co., Cleveland, O.  
Buffalo Brick Co., Buffalo, Kans.  
Cleveland Brick & Clay Co., Cleveland, O.  
Collinwood Shale Brick Co., Cleveland, O.  
Corry Brick & Tile Corp., Corry, Pa.  
Crescent Brick Co., Pittsburgh, Pa.  
Georgia Vit. Brick Co., Augusta, Ga.  
Globe Brick Co., E. Liverpool, O.  
Hammond Fire Brick Co., Fairmount, W. Va.  
Hixsylvania Coal Co., Columbus, O.  
Hocking Val. Brick Co., Columbus, O.  
McAvoy Vit. Brick Co., Phila., Pa.  
Mayer Brick Co., Bridgeville, Pa.  
Metropolis Pav. Br. Co., Pittsb'h, Kan.  
Metropolitan Pav. Br. Co., Canton, O.  
Mineral Wells Br. Co., Mineral Wells, Tex.  
Moberly Pav. Br. Co., Moberly, Mo.  
Murphyboro Pav. Brick Co., Murphyboro, Ill.  
Nelsonville Brick Co., Nelsonville, O.  
Patton Clay Mfg. Co., Patton, Pa.  
Paxton Brick Co., Watsontown, Pa.  
Peoria Pav. Br. Co., Portmouth, O.  
Peoria Brick & Tile Co., Peoria, Ill.  
Purinton Pav. Br. Co., Galesburg, Ill.  
Rose Shale Brick Co., Veederburg, Ind.  
Russell Clay Mfg. Co., Alton, Ala.  
So. Clay Mfg. Co., Chattanooga, Tenn.  
Spfld. Pav. Br. Co., Springfield, Ill.  
Sterling Brick Co., Olean, N. Y.  
Streator Clay Mfg. Co., Streator, Ill.  
Terre Haute Vit. Brick Co., Terre Haute, Ind.  
Thornton Fire Brick Co., Clarksburg, W. V.  
Thurber Brick Co., Thurber, Tex.  
Toronto Fire Clay Co., Toronto, O.  
Trinidad Br. & Tile Co., Trinidad, O.  
United Clay Prod. Corp., Kansas City  
West'n Shale Prod. Co., Ft. Scott, Kan.  
Westport Pav. Br. Co., Westport, Md.

## PAVING MACHINERY (See Road and Paving Machinery)

## PAVING GUARDS, STEEL

W. S. Godwin Co., Baltimore, Md.

## PAVING MATERIALS (See "Asphalt," "Paving Brick," "Granite Block," etc.)

## PAVING MIXERS (See Concrete Mixers)

## PAVING TOOLS

\*Aeroll Burner Co., West New York, N. J.  
\*Barber Asphalt Co., Phila., Pa.  
\*Connelly & Co., Phila., Pa.  
\*Jos. Honhorst Co., Cincinnati, O.  
\*Littleford Bros. Co., Cincinnati, O.  
\*Union Iron Wks., Inc., Hoboken, N. J.  
\*Warren Bros. Co., Boston  
W. H. Anderson Tl. & Sup. Co., Detroit  
Chausse Oil Burner Co., Elkhart, Ind.  
F. D. Oumner & Sons Co., Cleveland, O.  
Hauck Mfg. Co., Bklyn, N. Y.

## PERFORATED METALS

\*Littleford Bros., Cincinnati  
Allis-Chalmers Mfg. Co., Milwaukee  
Hendrick Mfg. Co., Carbondale, Pa.

## PICKS

Beall Tool Co., E. Alton, Ill.  
Hubbard Co., Pittsburgh, Pa.  
Independent Pneum. Tool Co., Chicago  
Iron City Tool Wks., Pittsburgh  
Klein-Logan Co., Pittsburgh  
Oliver Ir. & St. Corp., Verona, Pa.  
Verona Tool Wks., Verona, Pa.  
Warren Tool & Forge Co., Warren, O.  
Warwood Tool Co., Wheeling, W. Va.  
Wyoming Shovel Wks., Wyoming, Pa.

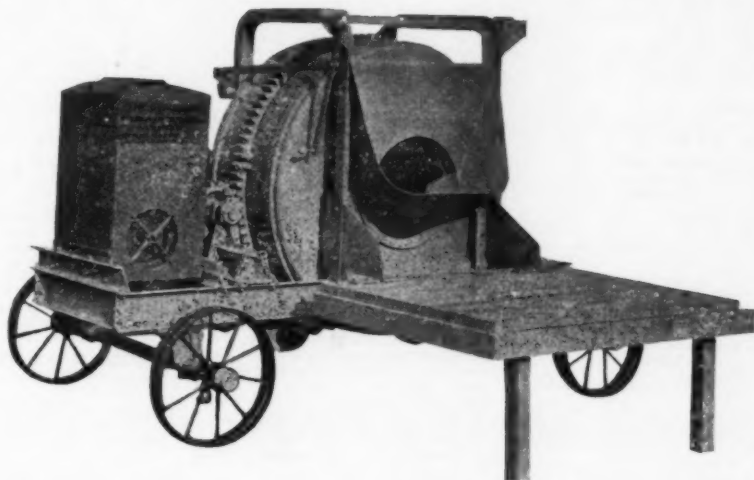
## PILE DRIVERS

\*Clyde Ir. Wks. Sales Co., Duluth, Minn.  
\*Erie Steam Shovel Co., Erie, Pa.

If you find any errors or omissions in this Where to Purchase list, please send corrections to  
CONTRACTORS AND ENGINEERS MONTHLY



# "THE STANDARD" PLASTER CONCRETE MORTAR MIXER



## THE ALL-PURPOSE MIXER

"The Standard" 7-S Mixer illustrated makes an ideal all-purpose mixer for the average contractor. Its design and construction have been time-tested, and incorporate the advantages of light weight, all-steel strength and exclusive narrow drum mixer noted for its quick charging, thorough mixing and quick discharging action.

It will mix plaster just as efficiently and smoothly as your concrete or mortar.



*Let us send the facts*

The Unique Drum Design  
Tells the Story

**THE STANDARD SCALE & SUPPLY CORPORATION**  
**PITTSBURGH PENNA.**

### DISTRICT OFFICES

New York: 145 Chamber Street  
Philadelphia: 510 Arch Street

Cleveland: 721 St. Clair Ave., N. E.  
Chicago: 1840 Michigan Ave.

# Where to Purchase

\*McKiernan-Terry Drill Co., N. Y.  
 \*Mead-Morrison Mfg. Co., E. Boston  
 \*Union Iron Wks., Inc., Hoboken, N. J.  
 Industrial Wks., Bay City, Mich.  
 Lidgerwood Manufacturing Co., N. Y.  
 McMyler Interstate Co., Cleveland, O.

## PILE-HAMMERS, STEAM

\*Clyde Ir. Wks. Sales Co., Duluth, Minn.  
 \*McKiernan-Terry Drill Co., N. Y.  
 \*Union Iron Wks., Inc., Hoboken, N. J.  
 \*Wemlinger, Inc., N. Y.  
 Industrial Wks., Bay City, Mich.  
 Ntl. Hoisting Eng. Co., Harrison, N. J.  
 Vulcan Iron Wks., Chicago

## PIILING, CONCRETE

MacArthur Conc. Pile & F'd'n. Co., N.Y.  
 Raymond Conc. Pile Co., N. Y.

## PIILING, INTERLOCKING STEEL

Bethlehem Steel Co., Bethlehem, Pa.  
 Carnegie Steel Co., Pittsburgh, Pa.

## PIILING, STEEL SHEET

\*Wemlinger, Inc., N. Y.  
 Bethlehem Steel Co., Bethlehem, Pa.

## PIPE CAST IRON

\*Central Fdry. Co., N. Y.  
 \*U. S. Cast Iron Pipe & Fdry. Co., Burlington, N. J.  
 Am. Cast Iron Pipe Co., Birmingham, Ala.  
 J. B. Clow & Sons, Chicago  
 Donaldson Iron Co., Emaus, Pa.  
 John Fox & Co., N. Y.  
 Glamorgan Pipe & Fdry. Co., Lynchburg, Va.  
 Lynchburg Fdry. Co., Lynchburg, Va.  
 McWane C. I. Pipe Co., Birmingham, Ala.  
 Nat. C. I. Pipe Co., Birmingham, Ala.  
 Warren Fdry. & Pipe Co., N. Y.  
 R. D. Wood & Co., Phila., Pa.

## PIPE, CULVERT (See Culverts)

## PIPE, LEAD

United Lead Company, N. Y.

## PIPE, REINFORCED CONCRETE

\*Newark Conc. Pipe Co., Newark, N. J.  
 Concrete Prod. Co., Pittsburgh, Pa.  
 Core Joint Conc. Pipe Co., Baltimore  
 Independent Conc. Pipe Co., Indianapolis  
 Lock Joint Pipe Co., Ampere, N. J.

## PIPE, RIVETED STEEL OR IRON

\*Counery & Co., Inc., Phila., Pa.  
 \*Jos. Honhorst Co., Cincinnati, O.  
 \*Littleford Bros., Cincinnati, O.  
 Abendroth & Root Mfg. Co., Newburgh, N. Y.  
 American Spiral Pipe Wks., Chicago  
 Biggs Boiler Wks., Akron.  
 Canton Culvert & Silo Co., Canton, O.  
 Chatta. Boiler & Tk. Co., Chatta., Tenn.  
 Chicago Bridge & Ir. Wks., Chicago  
 E. Jersey Pipe Co., N. Y.  
 Hamond Ir. Wks., Warren, Pa.  
 R. Hardesty Mfg. Co., Denver  
 Lancaster Iron Wks., Lancaster, Pa.  
 Pittsburgh-Des Moines Stl. Co., Pittsburgh, Pa.  
 Tippet & Wood, Phillipsburg, N. J.  
 Weller Mfg. Co., Chicago

## PIPE, STEEL

Central Tube Co., Pittsburgh, Pa.  
 E. Jersey Pipe Co., N. Y.  
 R. Hardesty Mfg. Co., Denver  
 Jones & Laughlin Stl. Co., Pittsburgh  
 National Tube Co., Pittsburgh  
 Republic Ir. & Stl. Co., Youngstown, O.  
 South Chester Tube Co., Chester, Pa.  
 Spang-Chalfont & Co., Pittsburgh, Pa.  
 Wheeling Stl. Corp., Wheeling, W. Va.  
 Youngstown Sheet & Tube Co., Youngstown, O.

## PIPE, WOOD

Amer. Wood Pipe Co., Tacoma, Wash.

Patterson-Williams Co., San Jose, Cal.  
 A. G. Spalding & Bros., Chicopee, Mass.  
 Cascade Pipe & Flume Co., Seattle, Wash.  
 Federal Tank & Pipe Co., Seattle, Wash.  
 Mich. Pipe Co., Bay City, Mich.  
 Pacific Pipe & Tank Co., S. Francisco.  
 Redwood Mfrs. Co., San Francisco  
 Standard Wd. Pipe Co., Williamsport, Pa.  
 A. Wyckoff & Sons Co., Elmira, N. Y.

## PIPE, WROUGHT IRON

A. M. Byers Co., Pittsburgh, Pa.

## PIPE BENDING MACHINES

Reading Iron Co., Reading, Pa.  
 Walworth Mfg. Co., Boston  
 Watson-Stillman Co., New York.

## PIPE COVERING

### AIRCELL

\*Philip Carey Co., Cincinnati, O.  
 Ehret Mag. Mfg. Co., Valley Forge, Pa.  
 Johns-Manville, Inc., N. Y.  
 Keasbey & Mattison Co., Ambler, Pa.  
 Ntl. Asbestos Co., Jersey City, N. J.  
 Norristown Mag. & Asb. Co., Norristown, Pa.  
 Sall Mountain Co., Chicago  
 H. F. Watson Co., Erie, Pa.

### 85 PER CENT MAGNESIA

\*Philip Carey Co., Cincinnati, O.  
 Ehret Mag. Mfg. Co., Valley Forge, Pa.  
 Johns-Manville, Inc., N. Y.  
 Keasbey & Mattison Co., Ambler, Pa.  
 Norristown Mag. & Asb. Co., Norristown, Pa.

### WOOD

Redwood Mfrs. Co., San Francisco  
 A. Wyckoff & Son Co., Elmira, N. Y.

## PIPE CUTTERS (See Cutters, Pipe, Hand)

## PIPE FITTINGS

\*Central Fdry. Co., N. Y.  
 \*U. S. Cast Iron Pipe & Fdry. Co., Burlington, N. J.  
 Amer. C. I. Pipe Co., Birmingham, Ala.  
 Builders Iron Fdry., Providence, R. I.  
 J. B. Clow & Sons, Chicago  
 Crane Co., Chicago  
 Donaldson Iron Co., Emaus, Pa.  
 Lunkenheimer Co., Cincinnati, O.  
 Ntl. C. I. Pipe Co., Birmingham, Ala.  
 Reading Stl. Casting Co., Inc., Bridgeport, Conn.  
 Warren Fdry. & Pipe Co., N. Y.  
 R. D. Wood & Co., Phila., Pa.

## PIPE HANDLING MACHINERY

Taylor Port. Stl. Derrick Co., Chicago  
 \*Philip Carey Co., Cincinnati, O.  
 \*Pacific Flush Tank Co., Chi. and N. Y.  
 G. K. Sales Co., Macungie, Pa.  
 Leadite Company, Inc., Phila., Pa.  
 Ruberoid Co., N. Y.  
 Texas Co., New York  
 Waring-Underwood Co., Phila., Pa.

## PIPE JOINT MATERIAL (Cast Iron)

Hydraulic Development Co., Boston  
 The Leadite Co., Phila., Pa.  
 United Lead Co., N. Y.

## PIPE PLUGS

\*Safety Gas Main Stopper Co., Brooklyn, N. Y.

## PIPE PUSHERS

Duff Mfg. Co., Pittsburgh.  
 Easy Mfg. Co., Lincoln, Neb.  
 Grant Mfg. Co., Council Bluffs, Ia.

## PLAYGROUND APPARATUS

American Playground Device Co., Anderson, Ind.  
 Chicago Gym. Equip. Co., Chicago  
 Everwear Mfg. Co., Springfield, O.  
 Giant Mfg. Co., Council Bluffs, Ia.  
 Hill-Standard Co., Anderson, Ind.  
 Fred. Medart Mfg. Co., St. Louis, Mo.  
 Mitchell Mfg. Co., Milwaukee

## PLOWS, CONTRACTORS'

\*Austin-West'n Ed. Mach. Co., Chicago  
 \*Caterpillar Trac. Co., San Leandro, Cal.  
 \*Gallon Ir. Wks. & Mfg. Co., Gallien, O.  
 \*Russell Grader Mfg. Co., Minneapolis  
 J. D. Adams & Co., Ind'polis, Ind.  
 American Steel Scraper Co., Sidney, O.  
 Burch Corp'n., Crestline, O.  
 Deere & Co., Moline, Ill.  
 C. D. Edwards Mfg. Co., Albert Lee, Minn.  
 International Harvester Co., Chicago  
 Roderick Lean Mfg. Co., Mansfield, O.  
 Moline Implement Co., Moline, Ill.  
 Oliver Chilled Plow Wks., S. Bend, Ind.  
 Sidney Steel Scraper Co., Sidney, O.  
 Slusser-McLean Scraper Co., Sidney, O.  
 Western Wheeled Scraper Co., Aurora, Ill.

Wiard Plow Co., Batavia, N. Y.

## PLOWS, ROOTER & GRADING

\*Ted Carr & Co., Chicago.  
 \*Wiard Plow Wks., Batavia, N. Y.

## PLUMBING SUPPLIES

J. B. Clow & Sons, Chicago  
 Crane Co., Chicago  
 Glauber Brass Mfg. Co., Cleveland, O.  
 Imperial Brass Mfg. Co., Chicago.  
 J. L. Mott Iron Wks., N. Y.  
 Mueller Company, Decatur, Ill.  
 Rundle-Spence Mfg. Co., Milwaukee  
 Walworth Mfg. Co., Boston

## PNEUMATIC CONCRETE PLACERS

\*Ransome Concrete Machy. Co., Dunellen, N. J.

## PNEUMATIC GROUT MIXERS & PLACERS

\*Ransome Concrete Machy. Co., Dunellen, N. J.

## POLES, STEEL STRUCTURAL

\*Blaw-Knox Co., Pittsburgh, Pa.  
 Elec. Ry. Equip. Co., Cincinnati, O.

## PORTABLE BUILDINGS

\*Blaw-Knox Co., Pittsburgh, Pa.  
 \*Littleford Bros., Cincinnati, O.  
 \*Truscon Steel Co., Youngstown, O.

## PORTABLE STEEL DERRICKS (See Derricks, Steel Portable)

## PORTABLE WOOD WORKERS

Jaeger Portable Power Corp., Detroit

## PORTLAND CEMENT (See Cement)

## POSTHOLE DIGGERS

\*Ransome Conc. Machy. Co., Dunellen, N.J.  
 Amer. Shov. & Stamp. Co., Lorain, O.  
 Baldwin Tl. Wks., Parkersburg, W. Va.  
 Brown Mfg. Co., Zanesville, Ohio.  
 The Buda Co., Harvey, Ill.  
 Champion Tl. & Hdle. Wks., Evert, Mich.  
 Columbus Handle & Tool Corp., Columbus, Ind.  
 Henry Diston & Sons, Inc., Philadelphia, Pa.  
 Empire Plow Co., Cleveland, O.  
 Four Wheel Drive Auto Co., Clintonville, Wis.  
 Franklin Equip. Co., Monticello, Ia.  
 Gibbs Mfg. Co., Canton, O.  
 Gowanda Agr. Wks., Gowanda, N. Y.  
 Hubbard & Co., Pittsburgh, Pa.  
 Iron City Tool Works, Pittsburgh, Pa.  
 Iwan Bros., South Bend, Ind.  
 Klein-Logan Co., Pittsburgh, Pa.  
 F. E. Kohler Co., Canton, O.  
 Leetonia Tool Co., Leetonia, O.  
 North Indianapolis Cradle Wks., Indianapolis, Ind.  
 Ohio Cultivator Co., Bellevue, O.  
 Oliver Iron & Stl. Corp., Pittsburgh, Pa.  
 W. H. Osmundson, Perry, Iowa.  
 Peck Fdry. & Mfg. Co., Le Mars, Ia.  
 Seymour Mfg. Co., Seymour, Ind.  
 G. A. Swinford Co., Canton, Ohio

\* Indicates that the manufacturer carries an advertisement. See index facing inside back cover.\*



McKiernan-Terry No. 2 Pile Hammers, driving wood sheeting. These and the other McKiernan-Terry Labor-Savers are being used in large numbers throughout the world. Fifteen were used recently on a single job in Brooklyn, New York. In another case, six miles of a sewer job were sheeted with 3 x 12 x 16 planks, driven to 12-foot penetration in coarse sand with McKiernan-Terry Labor Savers.

## McKiernan-Terry LIGHT Pile Hammers

Some users claim that one McKiernan-Terry Pile Hammer does the work of ten good men with mauls. This seems to be borne out by the fact that even in foreign countries where labor is very cheap it pays to use these remarkable little machines.

The secret is in the rapid blows of McKiernan-Terry Labor Savers. While the man with a maul is hitting once the Labor Saver hits fifty times. Husky blows, too. Powerful enough to penetrate stubborn materials, but without injury to the pile tops.

There are six larger McKiernan-Terry Hammers, up to the big 11-B-2 which weighs 13,185 pounds and drives the heaviest concrete monoliths.

All described and illustrated (*one hundred* large clear pictures) in the new McKiernan-Terry Catalog. Send for this book (on your letterhead, please) and you will find out why *three-fourths* of all the double-acting pile hammers sold *throughout the world* are made by McKiernan-Terry.

McKIERNAN-TERRY DRILL COMPANY  
19 Park Row, New York      Agents in Principal Cities



# McKiernan-Terry

DOUBLE-ACTING RAPID-DRIVING

## PILE HAMMERS

Do you mention the CONTRACTORS AND ENGINEERS MONTHLY when writing? Please do.

## Where to Purchase

Verona Tool Works, Pittsburgh, Pa.  
Warren Tool & Forge Co., Warren, O.  
Wood Shovel & Tool Co., Piqua, Ohio  
Western St. & Ir. Wks., De Pere, Wis.  
Wyoming Shovel Works, Wyoming, Pa.

### POWDER (See Explosives)

### POWER PLANTS, INDUSTRIAL

\*Alamo Engine Co., Hillsdale, Mich.  
\*Climax Eng. Co., Clinton, Ia.  
\*Continental Motors Corp., Muskegon, Mich.  
\*Hercules Motors Corp., Canton, O.  
\*Waukesha Motor Co., Waukesha, Wis.  
Buda Co., Harvey, Ill.  
Hinkley Motors, Inc., Detroit  
Sanderson-Cyclone Drill Co., Orrville, O.  
Serval Mfg. Co., Evansville, Ind.  
Wisconsin Motor Co., Milwaukee

### PULLING MACHINES

John Waldron Corp., New Brunswick, N. J.

### PUMP JACKS

\*John Lauson Mfg. Co., New Holstein, Wis.

### PUMPERS, FORD

American Steam Pump Co., Battle Creek, Mich.  
Jaeger Portable Machy. Co., Detroit.

### PUMPS, AIR LIFT

\*American Steam Pump Co., Battle Creek, Mich.  
\*Sullivan Mach. Co., Chicago  
Chicago Pneum. Tool Co., New York  
Indiana Air Pump Co., Indianapolis  
Ingersoll-Rand Co., N. Y.

### PUMPS, CENTRIFUGAL

\*Aldrich Pump Co., Allentown, Pa.  
\*American Steam Pump Co., Battle Creek, Mich.  
\*Cook Motor Co., Delaware, O.  
\*Domestic Eng. & Pump Co., Shippensburg, Pa.  
\*Humphreys Mfg. Co., Mansfield, O.  
\*Keystone Driller Co., Beaver Falls, Pa.  
\*Novo Engine Co., Lansing, Mich.  
Allis-Chalmers Mfg. Co., Milwaukee  
Amer. Well Works, Aurora, Ill.  
Aurora Pump & Mfg. Co., Aurora, Ill.  
Barnes Mfg. Co., Mansfield, O.  
Bethlehem Steel Co., Bethlehem, Pa.  
Buffalo Stm. Pump Co., Buffalo, A. S. Cameron Stm. Pump Wks., N. Y.  
Chicago Pump Co., Chicago  
Dayton-Dowd Co., Quincy, Ill.  
Dean Bros. Co., Indianapolis.  
De Laval Stm. Turb. Co., Trenton, N. J.  
Erie Pump & Eng. Wks., Medina, N. Y.  
Evinrude Motor Co., Milwaukee.  
Fairbanks, Morse & Co., Chicago  
General Elec. Co., Schenectady.  
Goulds Pumps, Inc., Seneca Falls, N. Y.  
Indiana Aid Pump Co., Indianapolis  
Ingersoll-Rand Co., New York  
LeCourtenay Co., Newark, N. J.  
Manistee Iron Wks., Manistee, Mich.  
Morris Mach. Wks., Baldwinville, N. Y.  
Rumsey Pump Co., Seneca Falls, N. Y.  
United Iron Wks., Inc., K. City, Mo.  
Warren Stm. Pump Co., Warren, Mass.  
Weinman Pump Mfg. Co., Columbus, O.  
Wheeler Condenser & Eng. Co., Carteret, N. J.  
Worthington Pump & Mch. Corp., N. Y.  
Yeomans Bros. Co., Chicago

### PUMPS, CONTRACTORS'

\*Aldrich Pump Co., Allentown, Pa.  
\*American Steam Pump Co., Battle Creek, Mich.  
\*Domestic Eng. & Pump Co., Shippensburg, Pa.  
\*Humphreys Mfg. Co., Mansfield, O.  
\*John Lauson Mfg. Co., New Holstein, Wis.

\*Kinney Mfg. Co., Boston  
\*Novo Engine Co., Lansing, Mich.  
\*Standard Scale & Supply Co., Pittsburgh  
\*Waukesha Motor Co., Waukesha, Wis.  
Allis-Chalmers Mfg. Co., Milwaukee  
Amer. Well Wks., Aurora, Ill.  
Aurora Pump & Mfg. Co., Aurora, Ill.  
Barnes Mfg. Co., Mansfield, O.  
Buda Co., Harvey, Ill.  
A. S. Cameron Stm. Pump Wks., N. Y.  
Ralph B. Carter Co., N. Y.  
C. H. & E. Mfg. Co., Milwaukee  
Construction Machy. Co., Waterloo, Ia.  
Dayton-Dowd Co., Quincy, Ill.  
Deming Co., Salem, O.  
Emerson Pump & Valve Co., Alexandria, Va.  
Erie Pump & Eng. Wks., Medina, N. Y.  
Fairbanks, Morse & Co., Chicago  
Goulds Pumps, Inc., Seneca Falls, N. Y.  
Ingersoll-Rand Co., New York  
Jaeger Portable Power Corp'n, Detroit  
LeCourtenay Co., Newark, N. J.  
Morris Mach. Wks., Baldwinville, N. Y.  
F. E. Myers & Bro. Co., Ashland, O.  
Pulsometer Steam Pump Co., N. Y.  
Rumsey Pump Co., Seneca Falls, N. Y.  
Van Noubuys Mach. Wks., Albany, N. Y.  
Waldo Bros. & Bond Co., Boston, Mass.

### PUMPS, DEEP WELL

\*Aldrich Pump Co., Allentown, Pa.  
\*American Steam Pump Co., Battle Creek, Mich.  
\*Domestic Eng. & Pump Co., Shippensburg, Pa.  
\*Humphreys Mfg. Co., Mansfield, O.  
\*Keystone Driller Co., Beaver Falls, Pa.  
\*Novo Engine Co., Lansing, Mich.  
Amer. Well Wks., Aurora, Ill.  
Barnes Mfg. Co., Mansfield, O.  
A. S. Cameron Stm. Pump Wks., N. Y.  
A. D. Cook, Inc., Lawrenceburg, Ind.  
Dean Bros. Co., Indianapolis.  
Deming Co., Salem, O.  
Goulds Pumps, Inc., Seneca Falls, N. Y.  
Harris Air Pump Co., Indianapolis  
Indiana Air Pump Co., Indianapolis  
Ingersoll-Rand Co., New York  
Layne & Bowler Co., Memphis, Tenn.  
A. Y. McDonald Mfg. Co., Dubuque, Ia.  
Midwest Eng. Co., Indianapolis, Ind.  
F. E. Myers & Bro. Co., Ashland, O.  
Rumsey Pump Co., Seneca Falls, N. Y.  
United Iron Wks., Inc., K. City, Mo.  
Weinman Pump Mfg. Co., Columbus, O.

### PUMPS, DIAPHRAGM

\*Domestic Eng. & Pump Co., Shippensburg, Pa.  
\*Humphreys Mfg. Co., Mansfield, O.  
\*Novo Engine Co., Lansing, Mich.  
\*Witte Eng. Wks., Kansas City, Mo.  
Aurora Pump & Mfg. Co., Aurora, Ill.  
Barnes Mfg. Co., Mansfield, O.  
Ralph B. Carter Co., N. Y.  
C. H. & E. Mfg. Co., Milwaukee  
Construction Machy. Co., Waterloo, Ia.  
Deming Co., Salem, O.  
Dorr Co., N. Y.  
Goulds Pumps, Inc., Seneca Falls, N. Y.  
Waldo Bros. & Bond Co., Boston, Mass.

### PUMPS, BREEDING

\*Novo Engine Co., Lansing, Mich.  
Elliott Mach. Corp., Baltimore, Md.  
Erie Pump & Eng. Co., Medina, N. Y.  
Ingersoll-Rand Co., New York  
Morris Mach. Wks., Baldwinville, N. Y.

### PUMPS, GASOLINE AND OIL

\*Kinney Mfg. Co., Boston  
S. F. Bowser & Co., Inc., Ft. Wayne, Ind.  
Gilbert & Barker Mfg. Co., Springfield, Mass.  
Ingersoll-Rand Co., New York

Tokheim Oil Tank & Pump Co., Ft. Wayne, Ind.  
Wayne Tank & Pump Co., Ft. Wayne, Ind.

### PUMPS, PORTABLE

\*American Steam Pump Co., Battle Creek, Mich.  
\*Humphreys Mfg. Co., Mansfield, O.  
\*John Lauson Mfg. Co., New Holstein, Wis.  
Evinrude Motor Co., Milwaukee.  
Jaeger Portable Power Corp., Detroit

### PUMPS, POWER

\*Aldrich Pump Co., Allentown, Pa.  
\*American Steam Pump Co., Battle Creek, Mich.  
\*Domestic Eng. & Pump Co., Shippensburg, Pa.  
\*Humphreys Mfg. Co., Mansfield, O.  
\*Kinney Mfg. Co., Boston  
\*Novo Eng. Co., Lansing, Mich.  
\*Waukesha Motor Co., Waukesha, Wis.  
Alamo Iron Wks., San Antonio, Tex.  
Allis-Chalmers Mfg. Co., Milwaukee  
Amer. Well Wks., Aurora, Ill.  
Aurora Pump & Mfg. Co., Aurora, Ill.  
Barnes Mfg. Co., Mansfield, O.  
Chicago Pump Co., Chicago  
Dayton-Dowd Co., Quincy, Ill.  
De Laval Stm. Turb. Co., Trenton, N. J.  
Deming Co., Salem, O.  
Evinrude Motor Co., Milwaukee.  
Fairbanks, Morse & Co., Chicago  
Gardner Governor Co., Quincy, Ill.  
Goulds Pumps, Inc., Seneca Falls, N. Y.  
Indiana Air Pump Co., Indianapolis  
Ingersoll-Rand Co., New York  
Lawrence Mach. Co., Lawrence, Mass.  
LeCourtenay Co., Newark, N. J.  
F. E. Myers & Bro. Co., Ashland, O.  
Northern Fire App. Co., Minneapolis.  
Rumsey Pump Co., Seneca Falls, N. Y.  
Weinman Pump Mfg. Co., Columbus, O.  
Worthington Pump & Mch. Corp., N. Y.  
Yeomans Bros. Co., Chicago.

### PUMPS, SEWAGE

\*American Steam Pump Co., Battle Creek, Mich.  
\*Amer. Well Wks., Aurora, Ill.  
\*Humphreys Mfg. Co., Mansfield, O.  
\*Pacific Flush Tank Co., Chi. and N. Y.  
Barnes Mfg. Co., Mansfield, O.  
A. S. Cameron Stm. Pump Wks., N. Y.  
Chicago Pump Co., Chicago.  
Fairbanks, Morse & Co., Chicago.  
Ingersoll-Rand Co., New York.  
Sanitation Corp., N. Y.  
Warren Stm. Pump Co., Warren, Mass.  
White Co., Cleveland, O.  
Yeomans Bros. Co., Chicago.

### PUMPS, TAR AND ASPHALT

\*Kinney Mfg. Co., Boston.

### RADIATORS FOR GASOLINE ENGINES

McCord Radiator Mfg. Co., Detroit.  
Modine Mfg. Co., Racine, Wis.  
Racine Radiator Co., Racine, Wis.

### RAIL AND RAIL JOINTS

Bethlehem Steel Co., Bethlehem, Pa.  
Carnegie Steel Co., Pittsburgh, Pa.  
Easton Car & Const. Co., Easton, Pa.  
Koppel Ind. Car & Equip. Co., Koppel, Pa.  
Sweet's Steel Co., Williamsport, Pa.

### RAILROAD DITCHERS (See Excavators, Ditch and Trench)

### RECORDERS, WATER STAGE

Bristol Co., Waterbury, Conn.  
Builders Iron Fdry., Providence, R. I.  
W. & L. E. Gurley, Troy, N. Y.

### REFRIGERATING MACHINERY (See Ice Making Machinery)

If you find any errors or omissions in this Where to Purchase list, please send corrections to  
CONTRACTORS AND ENGINEERS MONTHLY



# The POWER is There



## That's Why

the Bay City 16-B Full Crawler, rigged for trenching, operated by the General Contracting Company at Wayland, Mass., handled as high as

**980 ft. of trench per day!**

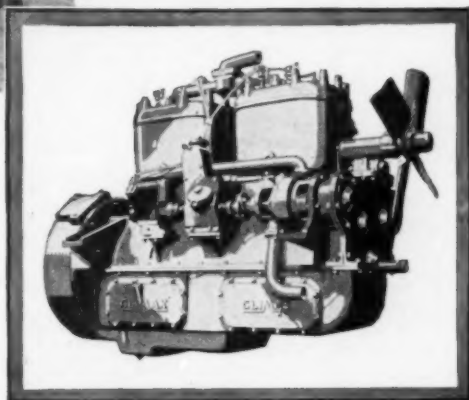
Unusual records like this are the experience of many a contractor who has discovered that there is extra profit every day from having his machines equipped with

# CLIMAX

Trade  
Mark  
Eng.  
U. S.  
Pat.  
Off.

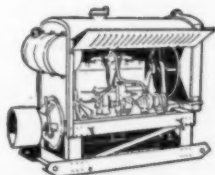
**The "Trustworthy" Engine**

Write for list of Manufacturers who have adopted Climax as Standard Equipment.

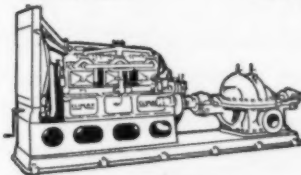


**CLIMAX ENGINEERING COMPANY, Clinton, Iowa**  
NEW YORK CHICAGO CLEVELAND

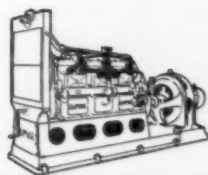
COAST MACHINERY CORPORATION  
San Francisco Los Angeles



One of the Climax Portable Power Units



Climax Centrifugal Pumping Unit



Climax Electric Generating Unit

Yes—we would like you to mention the CONTRACTORS AND ENGINEERS MONTHLY.

# Where to Purchase

## REINFORCING, CONCRETE (See Concrete Reinforcement)

### RIVETERS, PNEUMATIC

Alliance Machine Co., Alliance, O.  
Chicago Pneum. Tool Co., New York  
Cleveland Pneum. Tool Co., Cleveland, O.  
Hanna Eng. Works, Chicago.  
Helwig Mfg. Co., St. Paul, Minn.  
Independent Pneum. Tool Co., Chicago.  
Ingersoll-Rand Co., N. Y.  
Wm. H. Keller, Inc., Grand Haven, Mich.  
Shepherd Electric Crane & Hoist Co., Montour Falls, N. Y.  
Southwark Fdry. & Mach. Co., Phila.  
Watson-Stillman Co., N. Y.

### RIVET SETS

Chicago Pneum. Tool Co., New York.  
Cleveland Pneum. Tool Co., Cleveland, O.  
Dunbar Drop Forge Co., Chicago.  
Independent Pneum. Tool Co., Chicago.  
Ingersoll-Rand Co., N. Y.

### ROAD GRADERS, HORSE OR

#### TRACTOR DRAWN

\*Austin-West'n Rd. Mch. Co., Chicago.  
\*Baker Mfg. Co., Springfield, Ill.  
\*Gallion Ir. Wks. & Mfg. Co., Gallion, O.  
\*Good Rds. Mch. Co., Kennett Sq., Pa.  
\*Rome Mfg. Co., Rome, N. Y.  
\*Russell Grader Mfg. Co., Minneapolis.  
\*Gustav Schaefer Wagon Co., Cleveland.  
J. D. Adams & Co., Indianapolis, Ind.  
Austin Mfg. Co., Chicago.  
Beach Mfg. Co., Charlotte, Mich.  
C. D. Edwards Mfg. Co., Albert Lea, Minn.  
Gilbert Mfg. Co., Aberdeen, S. D.  
Killefer Mfg. Co., Los Angeles.  
Klauer Mfg. Co., Dubuque, Iowa.  
Little Red Wagon Mfg. Co., Omaha.  
Lyle Culv. & Rd. Equip. Co., Minneapolis.  
N. S. Monroe & Sons, Arthur, Ill.  
Owensboro Ditcher & Grader Co., Owensboro, Ky.  
Stockland Rd. Mach. Co., Minneapolis.  
Western Wheeled Scraper Co., Aurora, Ill.

### ROAD GRADERS, POWER

\*Acme Road Mach. Co., Frankfort, N. Y.  
\*Austin-West'n Rd. Mch. Co., Chicago.  
\*Gallion Ir. Wks. & Mfg. Co., Gallion, O.  
\*Good Rds. Mch. Co., Kennett Sq., Pa.  
\*W. A. Eidlitt Co., Bucyrus, O.  
\*Russell Grader Mfg. Co., Minneapolis.  
\*Spears-Wells Machy. Co., Oakland, Cal.  
Gilbert Mfg. Co., Aberdeen, S. D.  
Little Red Wagon Mfg. Co., Omaha.  
Shaw-Enoch Tractor Co., Minneapolis.  
Wehr Co., Milwaukee.

### ROAD MAINTAINERS, POWER

\*Spears-Wells Mach. Co., Oakland, Cal.

### ROAD OILS (See Oils, Road)

### ROAD OILERS

\*Austin-West'n Rd. Mch. Co., Chicago.  
\*Good Rds. Mch. Co., Kennett Sq., Pa.  
\*Kinney Mfg. Co., Boston.  
\*Mack Trucks, Inc., N. Y.  
\*Spears-Wells Machy. Co., Oakland, Cal.  
E. D. Etnyre & Co., Oregon, Ill.  
Municipal Sup. Co., So. Bend, Ind.  
White Co., Cleveland

### ROAD FLOWS

\*Spears-Wells Machy. Co., Oakland, Cal.

### ROAD SCRAPERS

\*Acme Rd. Mach. Co., Frankfort, N. Y.  
\*Austin-West'n Rd. Mch. Co., Chicago.  
\*Baker Mfg. Co., Springfield, Ill.  
\*Euclid Cr. & Hst. Co., Euclid Village, O.  
\*Gallion Ir. Wks. & Mfg. Co., Gallion, O.  
\*Good Rds. Mch. Co., Kennett Sq., Pa.  
\*La Plant-Ghosts Mfg. Co., Cedar Rapids, Ia.

\*Miami Trailer-Scraper Co., Troy, O.  
\*Russell Grader Mfg. Co., Minneapolis.  
\*Gustav Schaefer Wagon Co., Cleveland, O.  
J. D. Adams & Co., Indianapolis, Ind.  
Beach Mfg. Co., Charlotte, Mich.  
Davenport Mfg. Co., Los Angeles, Cal.  
Gilbert Mfg. Co., Aberdeen, S. D.  
Killefer Mfg. Co., Los Angeles.  
Roderick Lean Co., Mansfield, O.  
Little Red Wagon Mfg. Co., Omaha.  
Lyle Culv. & Rd. Equip. Co., Minneapolis.  
Miskin Scraper Works, Ucon, Ida.  
Root Spring Scraper Co., Kalamazoo.  
Shaw-Enoch Tractor Co., Minneapolis.  
Sidney Steel Scraper Co., Sidney, O.  
Stockland Rd. Mch. Co., Minneapolis.  
Western Wheeled Scraper Co., Aurora, Ill.

### ROAD AND PAVING MACHINERY

\*Acme Rd. Mach. Co., Frankfort, N. Y.  
\*Austin-West'n Rd. Mch. Co., Chicago.  
\*Baker Mfg. Co., Springfield, Ill.  
\*Barber Asphalt Co., Phila., Pa.  
\*Blaw-Knox Co., Pittsburgh, Pa.  
\*Buffalo-Springfield Roller Co., Springfield, O.  
\*Caterpillar Tractor Co., San Leandro, Cal. and Peoria, Ill.  
\*Convery & Co., Inc., Phila., Pa.  
\*Euclid Cr. & Hst. Co., Euclid Village, O.  
\*Gallion Ir. Wks. & Mfg. Co., Gallion, O.  
\*Good Rds. Mach. Co., Kennett Sq., Pa.  
\*Geo. Haiss Mfg. Co., N. Y.  
\*Heitzel St. Form & Ir. Co., Warren, O.  
\*Jos. Honhorst Co., Cincinnati, O.  
\*Kinney Mfg. Co., Boston.  
\*Koehring Co., Milwaukee.  
\*Lakewood Eng. Co., Cleveland, O.  
\*Littleford Bros., Cincinnati, O.  
\*Mack Trucks, Inc., N. Y.  
\*Russell Grader Mfg. Co., Minneapolis.  
\*Gustav Schaefer Wagon Co., Cleveland.  
\*T. L. Smith Co., Milwaukee.  
\*Spears-Wells Mch. Co., Oakland, Cal.  
J. D. Adams & Co., Indianapolis, Ind.  
Beach Mfg. Co., Charlotte, Mich.  
Chausse Oil Burner Co., Elkhardt, Ind.  
F. D. Cummer & Son Co., Cleveland, O.  
Easton Car & Const. Co., Easton, Pa.  
C. D. Edwards Mfg. Co., Albert Lea, Minn.  
Equitable Asph. Maint. Co., Kans. C. Mo.  
Erie Mach. Shops, Erie, Pa.  
J. D. Farsey Mfg. Co., Cleveland, O.  
Gilbert Mfg. Co., Aberdeen, S. Dak.  
Little Red Wagon Mfg. Co., Omaha.  
Shaw-Enoch Tractor Co., Minneapolis.  
Slusser-McLean Scraper Co., Sidney, O.  
Universal Rd. Mch. Co., Kingston, N. Y.

### ROAD AND PAVING ROLLERS

\*Acme Road Mach. Co., Frankfort, N. Y.  
\*Austin-West'n Rd. Mch. Co., Chicago.  
\*Barber Asphalt Co., Phila., Pa.  
\*Buffalo-Springfield Roller Co., Springfield, O.  
\*Gallion Ir. Wks. & Eng. Co., Gallion, O.  
\*Good Rds. Mach. Co., Kennett Sq., Pa.  
\*Huber Mfg. Co., Marion, O.  
\*Kinney Standards, Inc., Brooklyn, N. Y.  
Austin Mfg. Co., Chicago.  
Beach Mfg. Co., Charlotte, Mich.  
J. I. Case Threshing Mach. Co., Racine, Wis.  
Erie Mach. Shops, Erie, Pa.  
Horst & Strietor Co., Davenport, Ia.  
Wehr Co., Milwaukee.

### ROCK CRUSHERS AND PULVERIZERS (See Crushers)

### ROCK DRILLS (See Drills, Rock)

### ROLLERS, LAWN, TRACTOR POWER

\*Kinney Standards, Inc., Brooklyn, N. Y.

## ROOFING, ASBESTOS, ASPHALT, COMPOSITION, TILES, ETC.

\*Barber Asphalt Co., Phila., Pa.  
\*Barrett Co., N. Y.  
\*Philip Carey Co., Cincinnati, O.  
\*Standard Oil Co. (Indiana), Chicago.  
Amer. Cem. Tile Mfg. Co., Pittsburgh.  
Atlantic Ref. & Asph. Corp., Phila., Pa.  
Beaver Prod. Co., Inc., Buffalo, N. Y.  
Bird & Son, Inc., E. Walpole, Mass.  
Certain-teed Products Corp., N. Y.  
Chatfield Mfg. Co., Cincinnati, O.  
Edwards Mfg. Co., Cincinnati, O.  
Euclid Chemical Co., Cleveland.  
Flintkote Co., Boston.  
Johns-Manville, Inc., N. Y.  
Keystone Roofing Mfg. Co., York, Pa.  
The Lebon Co., Chicago.  
F. J. Lewis Mfg. Co., Chicago.  
Nat'l Roofing Co., Tonawanda, N. Y.  
Nat'l Sheet Metal Roofing Co., Jersey City, N. J.  
Ruberoid Co., N. Y.  
Sall Mountain Co., Chicago.  
Sifo Prod. Co., St. Paul, Minn.  
L. Sonneborn & Sons, Inc., N. Y.  
Texas Co., N. Y.  
Western Elastolite Roofing Co., Denver.

## ROOFING, METAL

\*Blaw-Knox Co., Pittsburgh, Pa.  
\*Truscon Steel Co., Youngstown, O.  
Amer. Rolling Mill Co., Middletown, O.  
Amer. Sheet & Tin Plate Co., Pittsb'h.  
Central Alloy Stl. Corp., Massillon, O.  
Edwards Mfg. Co., Cincinnati, O.  
Klauser Mfg. Co., Dubuque, Ia.  
Milwaukee Corr. Co., Milwaukee.  
Republic Ir. & Stl. Co., Youngstown, O.  
Youngtown Sheet & Tube Co., Youngstown, O.

## ROOFING KETTLES (See Kettles)

### ROOTERS

\*Ted Carr & Co., Chicago.  
Lakewood Eng. Co., Cleveland.

## ROPE, MANILA

Amer. Mfg. Co., B'klyn, N. Y.  
Columbian Rope Co., Auburn, N. Y.  
Copples Cordage Co., B'klyn, N. Y.  
Hooven & Allison Co., Xenia, O.  
R. A. Kelly Co., Xenia, O.  
N. Bedford Cordage Co., N. Bedford, Mass.  
Peoria Cordage Co., Peoria, Ill.  
Plymouth Cordage Co., N. Plymouth, Mass.  
Portland Cordage Co., Portland, Ore.  
Tabbs Cordage Co., San Francisco.  
Wall Rope Wks., N. Y.  
Waterbury Co., N. Y.  
Whitlock Cordage Co., N. Y.

## ROPE, WIRE, HOISTING, HAULAGE

\*American Steel & Wire Co., Chicago.  
\*W'msport Wire Rope Co., W'msport, Pa.  
Amer. Cable Co., Inc., N. Y.  
Broderick & Bascom Rope Co., St. Louis, Mo.  
Fischer & Hayes Rops & Steel Co., Chicago.  
Hazard Wire Rope Co., Wilkesbarre, Pa.  
A. Lechen & Sons Rope Co., St. Louis.  
Macwythe Co., Kenosha, Wis.  
J. A. Ryebing's Sons Co., Trenton, N. J.  
Upson-Walton Co., Cleveland, O.  
Waterbury Co., N. Y.  
Wickwire Spencer Steel Co., N. Y.

## RUBBER TIRES (See Tires)

### RULES

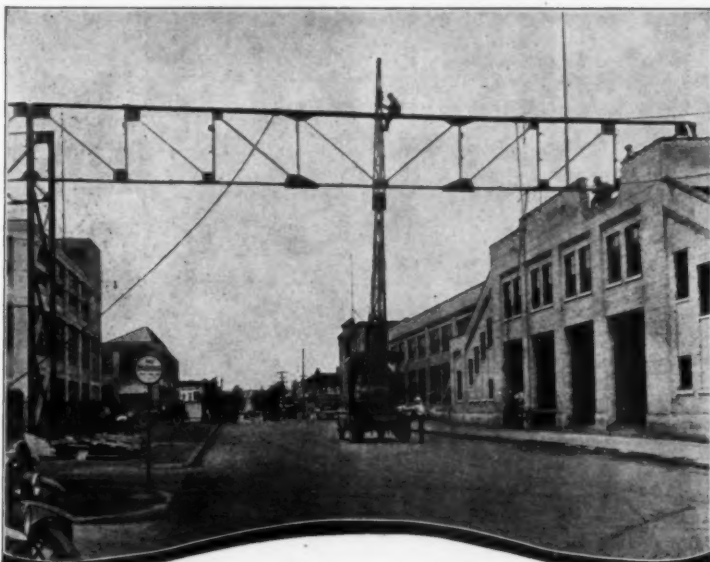
\*Larkin Rule Co., Saginaw, Mich.

### SALAMANDERS

\*Aeroll Burner Co., West New York, N.J.  
\*General Wheelbarrow Co., Akron, O.  
\*Jos. Honhorst Co., Cincinnati, O.  
\*Littleford Brothers, Cincinnati, O.  
Hauck Mfg. Co., B'klyn, N. Y.  
Jackson Mfg. Co., Harrisburg.

## SAFETY THREADS (See Treads, Safety)

\* Indicates that the manufacturer carries an advertisement. See index facing inside back cover.\*



Where 40 tons erected  
was considered a good day's work,  
this superintendent with a

## Universal Crane

and

# WILLIAMSPORT WIRE ROPE

Telfax Tape Marked  
Factory Certified

erected 65 tons of light steel daily

This crane belonging to Flint Builders Supply Company, equipped with a 24-ft. boom and standard 16-ft. boom head extension, erected the steel for a 3300-ft. conveyor system, which necessitated placing 80-ft. beams 29 feet in the air. When you have a job that must be finished on time, Williamsport is the safe wire rope to use. You get what you pay for when you buy Williamsport Certified Ropes.

**USE MADESCO MADE BLOCKS—THEY STAND THE GAFF**

## WILLIAMSPORT WIRE ROPE COMPANY

Main Office and Works:  
Williamsport, Pa.

Gen'l Sales Offices:  
Peoples Gas Bldg., Chicago, Ill.

# Where to Purchase

## SASH, ROLLER STEEL (See Window Frames and Sash)

### SAW HORSES

\*Everhot Mfg. Co., Maywood, Ill.

### SAW RIGS, PORTABLE

\*Amer. Saw Mill Mach. Co., Hackensack, N. J.  
 \*Witte Eng. Wks., Kans. City, Mo.  
 Beach Mfg. Co., Montrose, Pa.  
 O. H. & E. Mfg. Co., Milwaukee.  
 Knickerbocker Co., Jackson, Mich.  
 Leach Co., Oshkosh, Wis.  
 Jones Superior Mach. Co., Chicago.

### SAWS, HAND, POWER

\*F. L. Rogers & Co., Chicago.  
 \*Witte Eng. Wks., Kans. City, Mo.  
 Electro-Magnetic Tool Co., Chicago.  
 Flexway Corp., Cincinnati, O.  
 Ingersoll-Rand Co., New York.  
 Michel Elec. Hand Saw Co., Chicago.  
 Porter Cable Mach. Co., Syracuse.  
 Wappat Gear Wks., Pittsburgh, Pa.

### SCARIFIERS

\*Acme Rd. Mach. Co., Frankfort, N. Y.  
 \*Austin-West'n. Rd. Mch. Co., Chicago.  
 \*Barber Asphalt Co., Phila., Pa.  
 \*Buffalo-Springfield Roller Co., Springfield, O.  
 \*Gallion Jr. Wks. & Mfg. Co., Gallion, O.  
 \*Good Rds. Mach. Co., Kennett Sq., Pa.  
 \*Huber Mfg. Co., Marion, O.  
 \*Rome Mfg. Co., Rome, N. Y.  
 \*Russell Grader Mfg. Co., Minneapolis.  
 Austin Mfg. Co., Chicago.  
 C.D. Edwards Mfg. Co., Albert Lea, Minn.  
 Klauer Mfg. Co., Dubuque, Iowa.  
 Universal Rd. Mch. Co., Kingston, N.Y.

### SCARIFIERS, TEETH FOR

\*Gallion Jr. Wks. & Mfg. Co., Gallion, O.  
 \*Russell Grader Mfg. Co., Minneapolis.  
 Shunk Mfg. Co., Bucyrus, O.

### SCOOPS, SKIMMER & TRENCH

\*Bay City Dr. Wks., Bay City, Mich.  
 \*Keystone Driller Co., Beaver Falls, Pa.

### SCRAPERS, DRAGLINE

\*Erie Steam Shovel Co., Erie, Pa.  
 \*Link-Belt Co., Chicago.  
 \*Russell Grader Mfg. Co., Minneapolis.  
 \*Sauerman Bros., Chicago.  
 Austin Mfg. Co., Chicago.  
 Beach Mfg. Co., Charlotte, Mich.

### SCRAPERS, POWER DRAG

\*Erie Steam Shovel Co., Erie, Pa.  
 \*Russell Grader Mfg. Co., Minneapolis.  
 \*Sauerman Bros., Chicago.  
 Austin Mfg. Co., Chicago.

### SCRAPERS, ROAD (See Road Scrapers)

### SCRAPERS, SELF-LOADING

\*Baker Mfg. Co., Springfield, Ill.  
 \*Euclid Cr. & Hst. Co., Euclid Village, O.  
 \*Miami Trailer-Scraper Co., Troy, O.  
 \*Russell Grader Mfg. Co., Minneapolis.  
 \*Gustav Schaefer Wagon Co., Cleveland.  
 Davenport Mfg. Co., Los Angeles, Cal.  
 Perry Co., Sidney, Ohio.  
 Roderick Lean Co., Mansfield, O.  
 Shaw-Enoch's Tractor Co., Minneapolis.

### SCREENS, SAND, GRAVEL AND COAL

\*Acme Road Mach. Co., Frankfort, N. Y.  
 \*Atlas Eng. Co., Milwaukee, Wis.  
 \*Austin-Western Rd. Mch. Co., Chicago.  
 \*Chain Belt Co., Milwaukee, Wis.  
 \*Chicago Automatic Conv. Co., Chicago.  
 \*Gallion Jr. Wks. & Mfg. Co., Gallion, O.  
 \*Good Rds. Mch. Co., Kennett Sq., Pa.  
 \*Hais Mfg. Co., N. Y.  
 \*Link-Belt Co., Chicago.  
 \*Littleford Bros., Cincinnati, O.  
 \*Russell Grader Mfg. Co., Minneapolis.  
 \*Smith Eng. Wks., Milwaukee.  
 \*Allis-Chalmers Mfg. Co., Milwaukee.  
 Austin Mfg. Co., Chicago.  
 C. O. Bartlett & Snow Co., Cleveland, O.  
 Beach Mfg. Co., Charlotte, Mich.  
 Brown Htg. Machy. Co., Cleveland, O.

Deister Concentrator Co., Ft. Wayne, Ind.  
 Gifford-Wood Co., Hudson, N. Y.  
 Hendrick Mfg. Co., Carbondale, Pa.  
 Jeffrey Mfg. Co., Columbus, O.  
 Lytle Cult. & Rd. Equip. Co., Minneapolis, Minn.  
 Morrow Mfg. Co., Wellston, O.  
 Newaygo Eng. Co., Newaygo, Mich.  
 New Holland Mch. Co., N. Holland, Pa.  
 New Jersey Wire Cloth Co., Trenton, N. J.  
 Robins Conv. Belt Co., N. Y.  
 H. B. Sackett Screen & Chute Co., Chicago.  
 Universal Crusher Co., Cedar Rapids, Ia.  
 Universal Rd. Mach. Co., Kingston, N.Y.  
 Webster Mfg. Co., Chicago.  
 Weller Mfg. Co., Chicago.  
 Wickwire Spencer Steel Co., N. Y.

### SCREENS, SEWAGE

\*Link-Belt Co., Philadelphia.  
 Dorr Co., New York.  
 Green Bay Fdry. & Mach. Wks., Green Bay, Wis.  
 Sanitation Corp'n., N. Y.  
 Simplex Ejector Co., Chicago.

### SEWAGE DISINFECTION

\*Wallace & Tiernan Co., Inc., Newark, N. J.

### SEWAGE DISPOSAL APPARATUS

\*Link-Belt Co., Chicago.  
 \*Pacific Flush Tank Co., Chicago & N. Y.  
 Dorr Co., N. Y.  
 Sanitation Corp'n., N. Y.  
 Simplex Ejector Co., Chicago.

### SEWAGE EJECTORS

\*Pacific Flush Tank Co., Chicago & N. Y.  
 Sanitation Corp'n., N. Y.  
 Simplex Ejector Co., Chicago.  
 Yeomans Bros. Co., Chicago.

### SEWAGE PUMPS (See Pumps)

**SEWER BLOCKS, SEGMENT**  
 American Vit. Products Co., Akron, O.  
 Cannelton Sewer Pipe Co., Cannelton, Ind.  
 Denver Sewer Pipe & Clay Co., Denver, Col.  
 W. S. Dickey Clay Mfg. Co., Kansas City, Mo.  
 Evans & Howard Fire Brick Co., St. Louis, Mo.  
 Laclede Christy Clay Prod. Co., St. Louis, Mo.  
 Macomb Sewer Pipe Wks., Macomb, Ill.  
 Pacific Clay Prod. Co., L. Angeles, Cal.  
 Red Wing Sewer Pipe Co., Red Wing, Minn.  
 Robinson Clay Prod. Co., Akron, O.  
 Standard Fire Brick & Sewer Pipe Co., Pueblo, Col.

### SEWER BRACES

\*Templeton, Kenly & Co., Chicago

### SEWER CLEANING APPARATUS

Atla Corp., New York.  
 F. Biassell Co., Toledo, O.  
 Champion Corp., Hammond, Ind.  
 Self Propelling Nozzle Co., N. Y.  
 Turbine Sewer Mach. Co., Milwaukee.

### SEWER PIPE AND DRAIN TILE

American Vit. Prod. Co., Akron, O.  
 Blackmer & Post Pipe Co., St. Louis.  
 Wm. E. Dee Co., Chicago.  
 Denver Sewer Pipe & Clay Co., Denver, Col.  
 W. S. Dickey Clay Mfg. Co., K. City, Mo.  
 Evans & Howard Fire Brick Co., St. Louis.  
 Logan Clay Prod. Co., Logan, O.  
 Ohio Vit. Pipe Co., Uhrichville, O.  
 Patton Clay Mfg. Co., Patton, Pa.  
 Red Wing Sewer Pipe Co., Red Wing, Minn.  
 Robinson Clay Prod. Co., Akron, O.  
 Streator Clay Mfg. Co., Streator, Ill.

### SEWER PIPE FORMS

\*Heltzel Stl. Form & Ir. Co., Warren, O.

### SEWER RODS

F. Biassell Co., Toledo, O.  
 Champion Corp., Hammond, Ind.  
 Luck Sewer Equip. Co., Chicago.  
 Turbine Sewer Mach. Co., Milwaukee.

### SHARPENERS, DRILL STEEL

\*Gardner-Denver Co., Denver, Col.  
 \*Hardsoc Wonder Dr. Co., Ottumwa, Ia.  
 \*Sullivan Machy Co., Chicago.  
 Ingersoll-Rand Co., New York

### SHINGLES, METAL

Aluminum Co. of Am., Pittsburgh, Pa.  
 Berger Mfg. Co., Canton, O.  
 Edwards Mfg. Co., Cincinnati, O.  
 Klauer Mfg. Co., Dubuque, Ia.  
 Milwaukee Corrugating Co., Milwaukee.  
 Nat'l Sheet Metal Roofing Co., Jersey City, N. J.  
 Newport Rolling Mill Co., Newport, Ky.  
 Penn Metal Co., Boston.  
 Tiffin Art Metal Co., Tiffin, O.  
 Wheeling Metal Mfg. Co., Wheeling, W. Va.

### SEWER PIPE JOINT COMPOUNDS

\*Pacific Flush Tank Co., Chicago & N. Y.  
 G. K. Sales Agency, Macungie, Pa.  
 Ruberoid Co., N. Y.  
 Servisized Prod. Corp., Chicago.  
 Conc. Form Co., Inc., Syracuse, N. Y.  
 Quinn Wire & Iron Wks., Boone, Ia.  
 Raber & Lang Mfg. Co., Kendallville, Ind.

### SHORES

Concrete Eng. Co., Omaha, Neb.  
 Dayton Sure Grip & Shore Co., Dayton, O.  
 M. & M. Form Clamp Co., Minneapolis.  
 The O. D. G. Co., Owensboro, Ky.  
 H. W. Roos Co., Cincinnati, O.  
 Roos-Meyer-Recht Co., Cincinnati, O.  
 Symons Clamp & Mfg. Co., Chicago.  
 Universal Form Clamp Co., Chicago.

### SHOVELS, CRAWLING TRACTOR

\*Erie Steam Shovel Co., Erie, Pa.  
 \*Speeder Mch. Corp., Cedar Rapids, Ia.  
 \*Thew Shovel Co., Lorain, Ohio.  
 Amer. Hst. & Derrick Co., St. Paul.

### SHOVELS, ELECTRIC

\*Bay City Dredge Wks., Bay City, Mich.  
 \*Koehring Co., Milwaukee, Wis.  
 \*Link-Belt Co., Chicago.  
 \*Speeder Machy. Corp., Cedar Rapids, Ia.  
 \*Thew Shovel Co., Lorain, O.  
 Amer. Hst. & Derrick Co., St. Paul.  
 Bucyrus Co., So. Milwaukee, Wis.  
 Byers Mach. Co., Ravenna, O.  
 Industrial Wks., Bay City, Mich.  
 Marion Steam Shovel Co., Marion, O.  
 Osgood Co., Marion, O.

### SHOVELS, GASOLINE

\*Bay City Dredge Wks., Bay City, Mich.  
 \*Erie Steam Shovel Co., Erie, Pa.  
 \*General Excavator Co., Marion, O.  
 \*Insley Mfg. Co., Indianapolis.  
 \*Koehring Co., Milwaukee, Wis.  
 \*Link-Belt Co., Chicago.  
 \*Mead-Morrison Mfg. Co., Boston.  
 \*Orton Crane & Shovel Co., Chicago.  
 \*Speeder Machy. Corp., Cedar Rapids, Ia.  
 \*Star Drilling Machine Co., Akron, O.  
 \*Thew Shovel Co., Lorain, O.  
 \*Universal Power Shovel Co., Detroit.  
 Amer. Hst. & Derrick Co., St. Paul.  
 Amer. Steel Dredge Co., Ft. Wayne, Ind.  
 Austin Mach. Corp., Muskegon, Mich.  
 Brown Htg. Machy. Co., Cleveland, O.  
 Bucyrus Co., So. Milwaukee, Wis.  
 Byers Mach. Co., Ravenna, O.  
 Harnischfeger Corp., Milwaukee, Wis.  
 Industrial Wks., Bay City, Mich.  
 Marion Steam Shovel Co., Marion, O.  
 McMyler Interstate Co., Cleveland, O.  
 Osgood Co., Marion, O.

If you find any errors or omissions in this Where to Purchase list, please send corrections to

CONTRACTORS AND ENGINEERS MONTHLY



# KOEHRING

## Gasoline Dragline

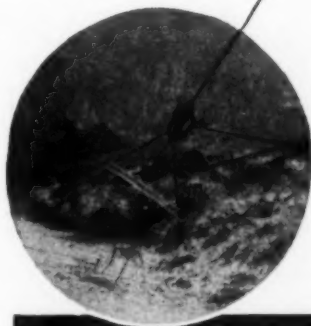


### Dragline Capacities

Quickly convertible to shovel or crane.  
No. 301—1 Yd. Bucket on 35' Boom; 1/2 Yd. Bucket on 40' Boom; 1/4 Yd. Bucket on 45' Boom.

Wisconsin four cylinder gasoline engine, 5 1/2" x 8 1/2", 1,000 R. P. M.  
No. 501—1 1/2 Yd. Bucket (weighing loaded 8,500 lbs.) on 40' Boom (to be used only in easy earth excavation); 1 1/4 Yd. Bucket (weighing loaded 7,150 lbs.) on 45' Boom; 1 Yd. Bucket (weighing loaded 6,200 lbs.) on 50' Boom; 3/4 Yd. Bucket (weighing loaded 4,500 lbs.) on 55' Boom.

Wisconsin four cylinder gasoline engine, 6" x 7", 925 R. P. M.



### No Cross Pull of Cable Against Sheaves

**S**AVES CABLES! Speeds operation!

The Koehring swiveling boom-point fairlead always follows the lead of the cable! No cross pull against the side of the sheave!

This means the elimination of a great amount of cable wear — a big decrease in a heavy item of dragline operation!

It means, too, faster operation. Operator dumps load, starts the reverse swing without need for exactness in putting boom into position!

**Fast!** The Koehring is *fast* in every function — in line speed — in accelerated hoisting speed — in responsive Finger-Tip ease of control! It's a machine for high speed operation — fortified with Koehring Heavy Duty Construction: *Know the Koehring!*

Write for Dragline Bulletin D. L. 6

**KOEHRING COMPANY, MILWAUKEE, WISCONSIN**

PAVERS, MIXERS—GASOLINE SHOVELS, CRANES AND DRAGLINES

Sales Offices and Service Warehouses in all principal cities  
Foreign Dept., Room 1370, 50 Church St., New York City  
Mexico, F. S. Lapun, Cinco De Mayo 21, Mexico, D. F.

A-3973



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# Where to Purchase

## SHOVELS, GASOLINE (FORDSON)

\*Insley Mfg. Co., Indianapolis, Ind.  
 \*Universal Power Shovel Co., Detroit.  
 Anthony Co., Streator, Ill.  
 Hughes-Keenan Co., Cleveland.  
 Mandt Company, Keokuk, Ia.  
 Milwaukee Elec. Crane & Mfg. Co., Milwaukee.  
 Squier-Rix Co., Milwaukee.

## SHOVELS, STEAM

\*Erie Steam Shovel Co., Erie, Pa.  
 \*Keystone Driller Co., Beaver Falls, Pa.  
 \*Orion Crane & Shovel Co., Chicago.  
 \*The Shovel Co., Lorain, O.  
 Amer. Hat. & Derrick Co., St. Paul.  
 Bellwood Stm. Shovel Co., Bellwood, Pa.  
 Bucyrus Co., So. Milwaukee, Wis.  
 Industrial Wks., Bay City, Mich.  
 Marion Steam Shovel Co., Marion, O.  
 Osgood Co., Marion, O.  
 Russell & Co., Massillon, O.

## SIDEWALK AND ROAD FORMS (See Forms, Concrete)

## SHOVELS, SPADES & SCOOPS

American Mfg. Co., Chattanooga, Tenn.  
 Ames Shovel & Tool Co., Boston.  
 Baldwin Tool Wks., Parkersburg, W. Va.  
 Beall Bros. Co., Alton, Ill.  
 Conneaut Shovel Co., Conneaut, O.  
 Hubbard & Co., Pittsburgh, Pa.  
 Indiana Shovel Co., New Castle, Ind.  
 Jackson Shovel Co., Montpelier, Ind.  
 Pittsburgh Shovel Co., Pittsburgh, Pa.  
 Russell Shovel Co., Alliquippa, Pa.  
 Stevens-Webb Co., Inc., Altoona, Pa.  
 Union Furnace Mfg. Co., Altoona, Pa.  
 Wood Shovel & Tool Co., Piqua, O.  
 Wyoming Shovel Wks., Wyoming, Pa.

## SIGNS, STREET AND ROAD

Alumoyd Sign & Signal Co., Chicago.  
 Auto Sign Display Co. of Mo., St. Louis, Mo.  
 Baltimore Enam. & Nov. Co., Baltimore.  
 Elkhart Fdry. & Mach. Co., Elkhart, Ind.  
 Evern-Century Sign Co., Boston.  
 Ingram-Richardson Mfg. Co., Beaver Falls, Pa.  
 Lyle-Signs, Minneapolis, Minn.  
 Municipal Street Sign Co., N. Y.  
 Ohio Traffic Devices Co., Columbus.  
 Rochester St. Signal Co., Rochester, N.Y.  
 Standard Mfg. Co., Cedar Falls, Ia.  
 Union Iron Prod. Co., E. Chicago, Ind.  
 Western Stamping & Mfg. Co., St. Paul.

## SLEEVES, TAPPING AND VALVE

Mueller Company, Decatur, Ill.  
 Renaissance Valve Co., Troy, N. Y.  
 A. P. Smith Mfg. Co., East Orange, N.J.

## SLUICE GATES (See Gates, Sluice)

## SMOKE STACKS (See Stacks, Steel)

## SNOW REMOVAL MACHINERY

\*Austin-Western Rd. Mch. Co., Chicago.  
 \*Baker Mfg. Co., Springfield, Ill.  
 \*Barber-Greene Co., Aurora, Ill.  
 \*Caterpillar Tractor Co., San Leandro, Calif. and Peoria, Ill.  
 \*Cleveland Tractor Co., Cleveland, O.  
 \*Good Rd. Mach. Co., Kennett Sq., Pa.  
 \*La Plant-Choate Mfg. Co., Cedar Rapids, Ia.  
 \*Mack Trucks, Inc., N. Y.  
 \*Mead-Morrison Mfg. Co., E. Boston.  
 \*Monarch Tractors Corp., Springfield, Ill.  
 \*Russell Grader Mfg. Co., Minneapolis.  
 Austin Mfg. Co., Chicago.  
 Byers Mach. Co., Ravenna, O.  
 C. D. Edwards Mfg. Co., Albert Lea, Miss.  
 Fox Rotary Snow Broom Co., N. Y.  
 Geo. Halse Mfg. Co., N. Y.  
 Hwy Service Corp., Wausau, Wis.  
 Killifer Mfg. Co., Los Angeles, Cal.  
 Klauer Mfg. Co., Dubuque, Iowa.  
 Linn Mfg. Co., Morris, N. Y.

## Owensboro Ditcher & Grader Co.,

Owensboro, Ky.  
 Rotary Snow Plow Co., Minneapolis.  
 Shaw-Enochs Tractor Co., Minneapolis.  
 W. M. Toy Co., Sidney, O.  
 Union-Iron Wks., Inc., Bangor, Me.  
 Walshs Holyoke St. Blr. Wks., Holyoke, Mass.  
 Walter Snow Fighters, L. I. City, N. Y.

## SNOW FENCING

\*Good Roads Machy. Co., Kennett Square, Pa.  
 Cyclone Fence Co., Waukegan, Ill.  
 Wickwire-Spencer Steel Co., N. Y.  
 SPADES (See Shovels)

## SPRAYERS, ASPHALT AND TAR

\*Littleford Bros., Cincinnati.  
 Kinney Mfg. Co., Boston.

## SPRAYING MACHINERY FOR TREES

Bean Spray Pump Co., Lansing, Mich.  
 Field Force Pump Co., Elmira, N. Y.  
 Fitzhenry-Guption Co., E. Cambridge, Mass.

## SPRAY PAINTING MACHINERY (See Painting Machinery)

## SPREADERS, STONE

\*Austin-Western Rd. Mch. Co., Chicago.  
 \*Gallon Ir. Wks. & Mfg. Co., Gallon, O.  
 Burch Corp'n., Crestline, O.  
 Shaw-Enochs Tractor Co., Minneapolis.  
 Universal Road Machy. Co., Kingston, N. Y.

## STACKS, STEEL

\*Blaw-Knox Co., Pittsburgh, Pa.  
 \*Connery & Co., Inc., Philadelphia.  
 \*Hell Co., Milwaukee, Wis.  
 \*Heltzel St. Form & Ir. Co., Warren, O.  
 \*Jos. Henhorst Co., Cincinnati, O.  
 \*Littleford Bros., Cincinnati, O.  
 Birmingham Tank Co., Birmingham, Ala.  
 Canton Art Metal Co., Canton, O.  
 Chatta. Boiler & Tank Co., Chatta., Tenn.  
 Chicago Bridge & Iron Wks., Chicago.  
 Graver Corp., Chicago.  
 N. Y. Central Iron Wks. Co., Inc., Hagerstown, Md.  
 Tippet & Wood, Phillipsburg, Pa.  
 Petroleum Iron Wks. Co., Sharon, Pa.  
 Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.  
 W. B. Scaife & Sons, Pittsburgh, Pa.  
 Walsh & Weidner Boiler Co., Chattanooga, Tenn.

## STANDPIPES & ELEVATED TANKS

W. E. Caldwell Co., Louisville, Ky.  
 Chatta. Blr. & Tank Co., Chatta., Tenn.  
 Chicago Bridge & Iron Wks., Chicago.  
 R. D. Cole Mfg. Co., Newnan, Ga.  
 Lancaster Iron Wks., Lancaster, Pa.  
 Pacific Tank & Pipe Co., San Francisco.  
 Petroleum Ir. Wks. Co., Sharon, Pa.  
 Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.  
 Tippet & Wood, Phillipsburg, Pa.  
 United Iron Wks., Inc., E. City, Mo.  
 Walsh & Weidner Boiler Co., Chattanooga, Tenn.

## STEAM SHOVELS (See Shovels, Steam)

## STEAM TURBINES (See Turbines)

## STEEL PLATE CONSTRUCTION

\*Blaw-Knox Co., Pittsburgh, Pa.  
 \*Connery & Co., Philadelphia.  
 \*Hell Co., Milwaukee, Wis.  
 \*Heltzel St. Form & Ir. Co., Warren, O.  
 \*Jos. Henhorst Co., Cincinnati, O.  
 \*Littleford Bros., Cincinnati, O.  
 \*Union Iron Wks., Inc., Hoboken, N. J.  
 Bethlehem Steel Co., Bethlehem, Pa.  
 Biggs Boiler Wks., Akron, O.  
 Birmingham Tank Co., Birmingham, Ala.  
 Chatta. Boiler & Tank Co., Chatta., Tenn.  
 Chicago Bridge & Iron Wks., Chicago.  
 Graver Corp., E. Chicago, Ind.  
 Hendrick Mfg. Co., Carbondale, Pa.  
 McClintie-Marshall Co., Pittsburgh, Pa.

## N. Y. Central Iron Wks. Co., Inc.,

Hagerstown, Md.  
 Penna. Bridge Co., Beaver Falls, Ia.  
 Petroleum Iron Wks. Co., Sharon, Pa.  
 Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.  
 Ritter-Conley Co., Pittsburgh, Pa.  
 W. B. Scaife & Sons, Pittsburgh, Pa.  
 Walsh & Weidner Blr. Co., Chatta., Tenn.

## STEEL SHEET PILING

\*Wemlinger, Inc., N. Y.

## STEEL TOWERS, CONCRETE

\*Insley Mfg. Co., Indianapolis, Ind.  
 \*Ransome Conc. Mch. Co., Dunellen, N.J.

## STOKERS, MECHANICAL

Automatic Furnace Co., Dayton, O.  
 Babcock & Wilcox Co., N. Y.  
 Combustion Engineering Corp., N. Y.  
 Detroit Stoker Co., Detroit.  
 Green Eng. Co., E. Chicago, Ind.  
 Sanford Riley Stoker Co., Worcester, Mass.  
 Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

## STREET AND ROAD SIGNS (See Signs)

## STREET BROOMS

Ind. Brush & Broom Mfg. Co., Indianapolis, Ind.  
 Kendallville Broom & Brush Co., Kendallville, Ind.  
 Lang Broom Co., Pittsburgh, Pa.  
 Jos. Lay Co., Portland, Ind.  
 Osborn Mfg. Co., Cleveland, O.  
 Standard Brh. & Brm. Mfg. Co., Ch'go.

## STREET CLEANERS' CARTS

Durlach Can & Iron Wks., B'klyn, N.Y.  
 Rochester Can Co., Rochester, N. Y.  
 Tarrant Mfg. Co., Saratoga Springs, N.Y.

## STREET FLUSHERS AND SPRINKLERS

\*Austin-Western Rd. Mch. Co., Chicago.  
 \*Gallon Ir. Wks. & Mfg. Co., Gallon, O.  
 \*Hell Co., Milwaukee, Wis.  
 \*Kinney Mfg. Co., Boston.  
 \*Mack Trucks, Inc., N. Y.  
 \*Whitehead & Kales Co., Detroit.  
 Austin Mfg. Co., Chicago.  
 Autocar Co., Ardmore, Pa.  
 E. D. Einyre & Co., Oregon, Ill.  
 Federal Motor Truck Co., Detroit.  
 General Motors Truck Co., Chicago.  
 Chas. Hvas & Co., N. Y.  
 Municipal Supply Co., So. Bend, Ind.  
 White Co., Cleveland, O.

## STREET LAMP POSTS

\*Novo Engine Co., Lansing, Mich.  
 Amer. Conc. Prod. Co., Forest Park, Ill.  
 Chicago Conc. Post Co., Chicago.  
 J. B. Clow & Sons, Chicago.  
 Electric Ry. Equip. Co., Cincinnati, O.  
 King Mfg. Co., Chicago.  
 Logan Co., Louisville, Ky.  
 J. L. Mott Iron Wks., New York.  
 J. S. Schofield's Sons Co., Macon, Ga.  
 Union Metal Mfg. Co., Canton, O.  
 Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

## STREET SIGNS (See Signs, Street)

## STREET SWEEPERS

\*Austin-Western Rd. Mch. Co., Chicago.  
 \*Kinney Mfg. Co., Boston.  
 \*Whitehead & Kales Co., Detroit.  
 Austin Mfg. Co., Chicago.  
 Butler Mfg. Co., Cleveland, O.  
 Elgin Sales Corp., N. Y.

## STREET SWEEPER BROOMS

### REFILLED

Kendallville Broom & Brush Co., Kendallville, Ind.  
 Lang Broom Co., Pittsburgh, Pa.  
 Jos. Lay Co., Portland, Ind.  
 Osborn Mfg. Co., Cleveland, O.  
 Standard Brh. & Brm. Mfg. Co., Ch'go.

\* Indicates that the manufacturer carries an advertisement. See index facing inside back cover.\*

## STEEL INSURES STRENGTH AND SECURITY

# ABOLISHING SPECIFICATION EVILS

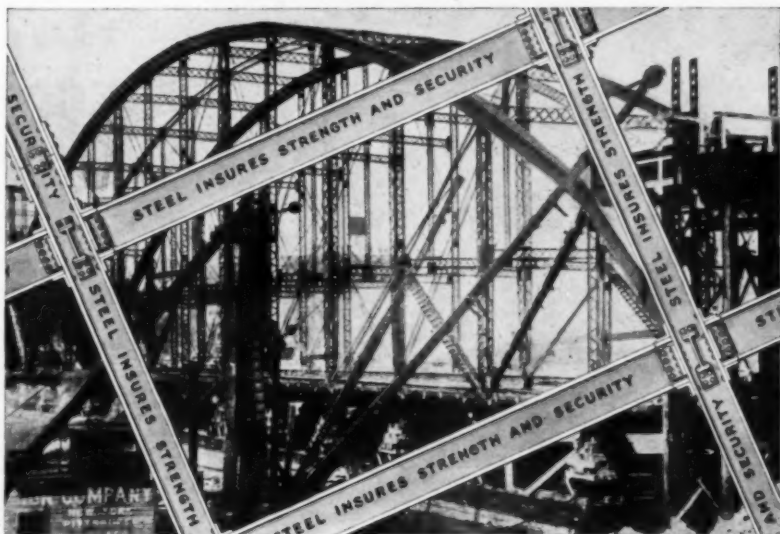


Photo Courtesy "Construction News"

Removal of the south span of the Sixth Street Bridge, Pittsburgh, Pa. After many years' service the bridge was in such good condition that it could be removed safely for re-erection. The span has been lowered and placed on pontoons ready for floating downstream. The removal of this 440-foot truss span intact is an amazing tribute to the flexibility of structural steel.

The American Institute of Steel Construction has cleared up a dozen problems which have vexed specification writers for years. The Institute's data on these problems will be found in the Institute's Code of Standard Practice.



The Code segregates steel and iron items in standard classifications. It includes sections fully covering invoices, drawings and specifications, workmanship, instruction

and delivery, erection, extra work, proposals and contracts.

The Code supplements the Institute's Standard Specification, which is estimated to be saving more than \$30,000,000 a year for owners and taxpayers. Send for the Code and Standard Specification and for the informative fact-book, "Steel Never Fails." We will mail both free of charge or obligation on your part.

## AMERICAN INSTITUTE OF STEEL CONSTRUCTION, Inc.

The co-operative non-profit service organization of the structural steel industry of the United States and Canada. Correspondence is invited. Address: 285 Madison Avenue, New York City.

Do you mention the CONTRACTORS AND ENGINEERS MONTHLY when writing? Please do.

# Where to Purchase

## STUMP PULLERS

- \*Ersted Machy. Mfg. Co., Portland, O.
- \*La Plant-Chaste Mfg. Co., Cedar Rapids, Ia.
- H. L. Bennett & Co., Westerville, O.
- John Waldron Corp., New Brunswick, N. J.

## SUBGRADING MACHINES

- \*Koebring Co., Milwaukee.
- \*Lakewood Eng. Co., Cleveland, O.
- The Hug Co., Highland, Ill.
- Shaw-Enoch Tractor Co., Minneapolis.

## SUPERHEATERS

- Babcock & Wilcox Co., N. Y.
- Power Specialty Co., N. Y.
- Superheater Co., N. Y.

## SURVEYORS' INSTRUMENTS (See Instruments)

## SWITCHBOARDS

- Allis-Chalmers Mfg. Co., Milwaukee.
- General Elec. Co., Schenectady, N. Y.
- Wagner Elec. Mfg. Co., St. Louis, Mo.
- Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

## TAMPING MACHINES

- \*Cement Block Mch. Co., Newark, N.J.
- Abrams Cement Tool Co., Detroit.
- Chicago Pneum. Tool Co., N. Y.
- Harnischfeger Corp., Milwaukee, Wis.
- Independent Pn. Tool Co., Chicago.
- Ingersoll-Rand Co., N. Y.

## TANKS, AIR COMPRESSOR

- \*Connery & Co., Inc., Philadelphia.
- \*Heil Co., Milwaukee, Wis.
- \*Littleford Bros., Cincinnati, O.
- Biggs Boiler Wks., Akron, O.
- Birmingham Tank Co., Birmingham, Ala.
- Chicago Bridge & Iron Wks., Chicago
- Chicago Pneum. Tool Co., N. Y.
- Curtis Pn. Mch. Co., St. Louis, Mo.
- Graver Corp., E. Chicago, Ind.
- Indiana Air Pump Co., Indianapolis.
- Ingersoll-Rand Co., N. Y.
- Lancaster Iron Wks., Lancaster, Pa.
- Nagle Eng. & Boiler Wks., Erie, Pa.
- National Tube Co., Pittsburgh, Pa.
- Petroleum Iron Wks. Co., Sharon, Pa.
- Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.
- W. B. Scaife & Sons, Pittsburgh, Pa.
- Westinghouse Tract. Brake Co., Wilmerding, Pa.
- Worthington Pump & Mch. Corp., N.Y.

## TANKS, STEEL

- \*Connery & Co., Philadelphia.
- \*Heil Co., Milwaukee, Wis.
- \*Jos. Honhorst Co., Cincinnati, O.
- \*Littleford Bros., Cincinnati, O.
- Bausman Mfg. Co., Millersville, Pa.
- Biggs Boiler Wks., Akron, O.
- Birmingham Tank Co., Birmingham, Ala.
- S. P. Bowser & Co., Inc., Ft. Wayne, Ind.
- J. I. Case Threshing Mach. Co., Racine, Wis.
- W. E. Caldwell Co., Louisville, Ky.
- Canton Art Metal Co., Canton, O.
- Chatta. Boiler & Tank Co., Chattanooga, Tenn.
- Chicago Bridge & Iron Wks., Chicago.
- Columbian St. Tank Co., K. City, Mo.
- Dover Boiler Wks., N. Y.
- Farrell Mfg. Co., Joliet, Ill.
- C. C. Fouts Co., Middletown, O.
- Graver Corp., E. Chicago, Ind.
- R. Hardesty Mfg. Co., Denver, Col.
- Hendrick Mfg. Co., Carbondale, Pa.
- Lancaster Iron Wks., Lancaster, Pa.
- Nagle Eng. & Boiler Wks., Erie, Pa.
- N. Y. Central Iron Wks. Co., Hagerstown, Md.
- Pacific Tank & Pipe Co., San Francisco.
- Petroleum Iron Wks. Co., Sharon, Pa.
- Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.

- Ritter-Conley Co., Pittsburgh, Pa.
- W. B. Scaife & Sons, Pittsburgh
- United Iron Wks., Inc., K. City, Mo.
- Walsh & Weidner Boiler Co., Chattanooga, Tenn.

## TANKS, WOOD

- W. E. Caldwell Co., Louisville, Ky.
- G. M. Davis & Son, Palatka, Fla.
- Eagle Tank Co., Chicago.
- Hauser-Stander Tank Co., Cincinnati, O.
- Kalamazoo Tank & Silo Co., Kalamazoo, Mich.
- Nat'l. Tank & Pipe Co., Portland, Ore.
- Pacific Tank & Pipe Co., San Francisco.
- Redwood Mfrs. Co., San Francisco.
- A. T. Stearns Lumber Co., Boston.
- U. S. Wind Eng. & Pump Co., Batavia, Ill.
- Wendnagel & Co., Chicago.

## TANK WAGONS

- \*Acme Rd. Mach. Co., Frankfort, N. Y.
- \*Gallon Ir. Wks. & Mfg. Co., Gallien, O.
- \*Heil Co., Milwaukee, Wis.
- \*Jos. Honhorst Co., Cincinnati, O.
- \*Mack Trucks, Inc., N. Y.
- Butler Mfg. Co., Minneapolis, Minn.
- J. I. Case Threshing Mach. Co., Racine.

## TAPES, STEEL AND METALLIC

- \*Lufkin Rule Co., Saginaw, Mich.
- Eugene Dietzgen Co., N. Y.
- Kneffel & Esser Co., Hoboken, N. J.
- The L. S. Starrett Co., Athol, Mass.

## TAR

- \*Barrett Co., N. Y.
- Amer. Tar Prod. Co., Pittsburgh, Pa.

## TARPAULINS WATERPROOF

- \*Hoosier Tarpaulin & Canvas Goods Co., Indianapolis, Ind.

## TAR KETTLES (See Kettles)

## THAWING OUTFITS

- \*Aeroll Burner Co., West New York, N.J.
- \*Littleford Bros., Cincinnati.
- Hauck Mfg. Co., Bklyn., N. Y.

## TIE TAMPERS

- Electric Tamper & Equip. Co., Chicago.

## TIE BOLTS FOR WALL FORMS

- Hawley Tie Bolt Co., Minneapolis
- M. & M. Wire Clamp Co., Minneapolis.

## TIES, STEEL

- Carnegie Steel Co., Pittsburgh, Pa.
- Int'l. Steel Tie Co., Cleveland, O.
- Koppel Ind. Car & Equip. Co., Koppel, Pa.
- Sweet's Steel Co., Williamsport, Pa.

## TIMBER CLAMPS

- M. & M. Wire Clamp Co., Minneapolis.
- Pyle-Rogers Corp., N. Y.

## TIRES, RUBBER (For Motor Trucks)

- Firestone Tire & Rubber Co., Akron, O.
- Fisk Tire Co., Chicopee Falls, Mass.
- Goodrich Rubber Co., Akron, O.
- Goodyear Tire & Rubber Co., Akron, O.
- Kelly Springfield Tire Co., N. Y.
- U. S. Tire Co., N. Y.

## TOOL HOUSES, PORTABLE STEEL

- \*Blaw-Knox Co., Pittsburgh, Pa.
- \*Littleford Bros., Cincinnati, O.

## TORCHES, OIL (HEATING)

- \*Littleford Bros., Cincinnati.
- \*Mead-Morrison Mfg. Co., E. Boston.
- \*Alex. Milburn Co., Baltimore, Md.
- Chausse Oil Burner Co., Elkhart, Ind.
- Hauck Mfg. Co., Bklyn., N. Y.
- Hoosier Paint Wks., Ft. Wayne, Ind.
- Sewall Paint & Varnish Co., K. City, Mo.
- Sherwin-Williams Co., Cleveland, O.
- Tropical Paint & Oil Co., Cleveland, O.
- Truscon Laboratories, Detroit, Mich.

## TOWERS (See Standpipe, Tanks and Towers)

## TRACKS, INDUSTRIAL AND PORTABLE

- \*Lakewood Eng. Co., Cleveland, O.
- Atlas Car & Mfg. Co., Cleveland, O.
- Bethlehem Steel Co., Bethlehem, Pa.
- Chase Fdry. & Mfg. Co., Columbus, O.
- Easton Car & Const. Co., Easton, Pa.
- C. W. Hunt Co., Inc., W.N. Brighton, N.Y.
- Koppel Ind. Car & Equip. Co., Koppel, Pa.
- Sweet's Steel Co., Williamsport, Pa.

## TRACTION TREADS (See Treads, Traction)

## TRACTORS

- \*Caterpillar Tractor Co., San Leandro, Calif.
- \*Cleveland Tractor Co., Cleveland, O.
- \*Geo. Hais Mfg. Co., New York.
- \*Huber Mfg. Co., Marion, O.
- \*J. T. Tractor Co., Cleveland, O.
- \*John Lauson Co., New Holstein, Wis.
- \*Mack Trucks, Inc., N. Y.
- \*Mead-Morrison Mfg. Co., E. Boston.
- \*Monarch Tractors Corp., Springfield, Ill.
- Advance-Rumely Thresher Co., Laporia, Ind.
- Allis-Chalmers Mfg. Co., Milwaukee
- Bates Mfg. Co., Joliet, Ill.
- J. I. Case Threshing Co., Racine, Wis.
- Clark Tractor Co., Battle Creek, Mich.
- Electric Wheel Co., Quincy, Ill.
- Emerson-Brantingham, Rockford, Ill.
- Ford Motor Co., Detroit, Mich.
- Hart-Parr Co., Charles City, Ia.
- Int'l. Harvester Co., Chicago
- Kinnard & Haines, Minneapolis, Minn.
- Lombard Tractor & Truck Corp., N. Y.
- Minneapolis Steel & Mach. Co., Minneapolis.
- Rogers Bros. Corp., Albion, Pa.
- Shaw-Enoch Tractor Co., Minneapolis, Wis.
- Wehr Co., Milwaukee.

## TRACTOR ACCESSORIES

- \*Trail-IT Co., St. Paul, Minn.
- \*Whitehead & Kales Co., Detroit.
- Pickering Governor Co., Portland, Conn.

## TRACTOR HITCHES

- \*Trail-IT Co., St. Paul, Minn.
- Whitehead & Kales Co., Detroit.

## TRAFFIC LINE MARKERS

- Carrara Paint Co., Cleveland.
- Continental Prod. Co., Euclid, O.
- Line-O-Graph Co., N. Y.
- Tenn. Tool Wks. Inc., Knoxville, Tenn.

## TRAFFIC PAINT

- J. E. Bauer Co., Los Angeles, Cal.
- Continental Prod. Co., Euclid, O.
- Hanline Bros., Baltimore, Md.

## TRAFFIC PLATES

- Allan Wood Ir. & St. Co., Phila.
- Amer. Pressed Steel Co., Phila.
- Central Ir. & St. Co., Harrisburg, Pa.

## TRAFFIC SIGNAL EQUIPMENT

- Acme Traffic Signal Co., Los Angeles.
- Alumoyd Sign & Signal Co., Chicago.
- Amer. Gas Accumulator Co., Elizabeth, N. J.
- Auto Sign Display Co. of Mo., St. Louis, Mo.
- Cretney Traffic Guide Co., Madison, Wis.
- Crouse-Hinds Co., Syracuse, N. Y.
- Esco Mfg. Co., Peoria, Ill.
- Evernu-Century Sign Co., Boston.
- Grasvold Safety Signal Co., Moline, Ill.
- Harrington-Seaberg Corp., Newark, N.J.
- Jorni Signal Mfg. Corp., Newark, N.J.
- Line Material Co., So. Milwaukee, Wis.
- Little Giant Co., Mankato, Minn.
- Lyle-Signs, Minneapolis, Minn.

If you find any errors or omissions in this Where to Purchase list, please send corrections to  
CONTRACTORS AND ENGINEERS MONTHLY

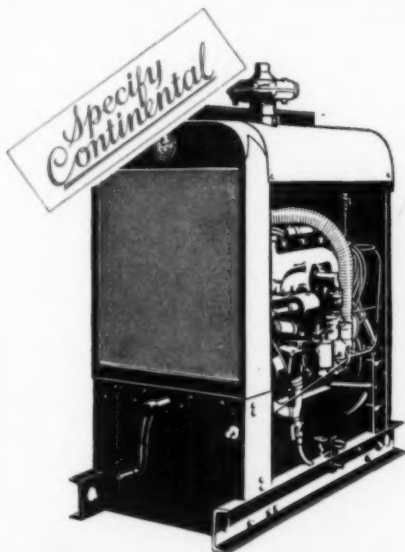


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Chausse Portable Asphalt Plant powered with a Red Seal Continental Industrial Power Unit.

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Over a period of 26 years Continental have held to an unswerving policy of concentration on gasoline motor building.

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Folder No. 205 discusses our recent change of name from The Akron Barrow Company to General Wheelbarrow Company. A request on your letterhead will bring a copy.

## *The* GENERAL All-Steel Mortar Box *Excels for Winter Use*

**A**LWAYS leak-proof, break-proof, waste-proof, the General shows to its greatest advantage in cold weather. Raise it on a few bricks, build a fire under it, and keep your mortar always at the proper temperature. The General All-Steel Mortar Box has exclusive merits that we'd like to set before you —

*in the form of General Bulletin No. 206,  
a copy of which is yours for the asking.*

**GENERAL WHEELBARROW COMPANY**

*Formerly THE AKRON BARROW COMPANY*

3140 East 65th Street

Cleveland, Ohio



General Wheelbarrow Company also makes a full line of Contractors' Barrows, asplendid Concrete Cart, collapsible Salamanders, Drag Scrapers and Fresno Scrapers, etc. Have you seen our present Catalog?

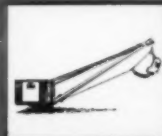
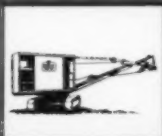
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**FULL REVOLVING**

*"more features  
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any other"*

It digs and does all things  
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MARION, OHIO, U. S. A.**



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Gentlemen: We are users of Sterling Wheelbarrows, having used large quantities in the past. At the present time we are using these barrows on the Western Electric Company job - Kearny, N.J.

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TURNER CONSTRUCTION COMPANY

J. E. Buhl,  
Plant Engineer.

*J. E. B.*

Interchangeable parts,  
simplified units, and proper  
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Sterling construction.

Write for Bulletin  
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## STERLING WHEELBARROW COMPANY

Milwaukee



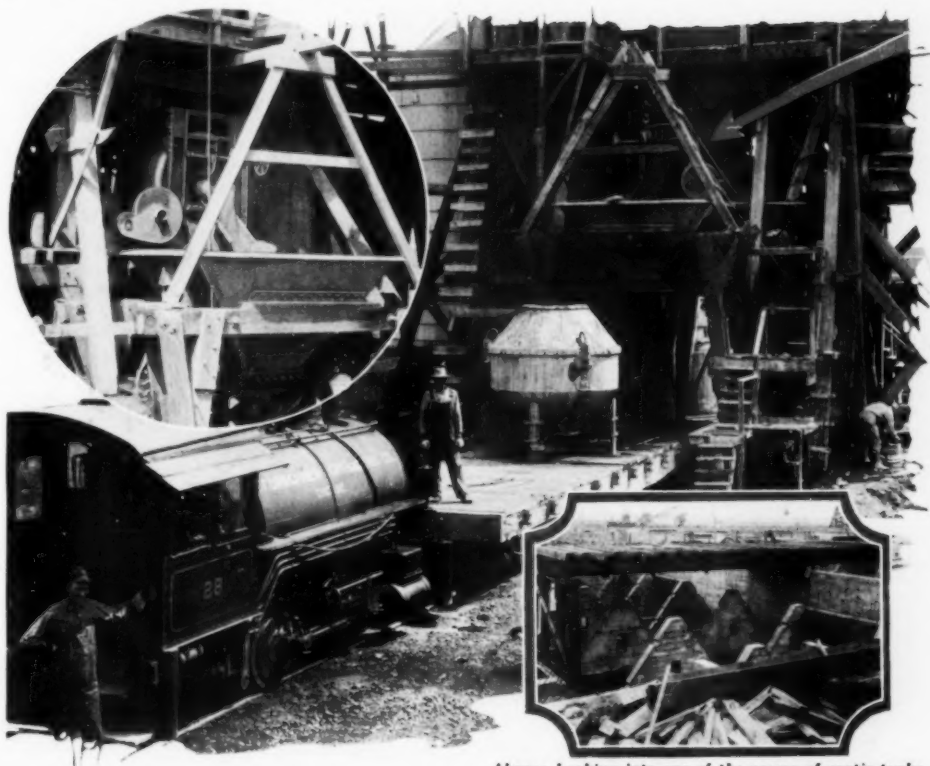
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Above: Looking into one of the scores of septic tanks

## Forschner of Chicago uses Smiths



For the smaller jobs, the Smith 3 1/2-S Tilter with Power Loader—other sizes 2 1/2-S to 112-S

[[ Catalog 526 is not only a display of mixers but is also a complete manual on concrete. Have you a copy? ]]

**H**IGH up in the central mixing plant two Smith 28-S Non-Tilting Mixers run continuously, most of their output being distributed over the septic tank area by railroad and overhead cableway—that discharged between trips going by belt conveyor to other parts of the work.

Hundreds of men are employed—trucks and cranes are everywhere—mountains of materials are brought in—but the key to progress on Chicago's new sewerage disposal plant is the dependability of the Smiths—chosen for big construction jobs for over 27 years.

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# SMITH MIXERS

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for SHOVEL - DITCHER - CRANE  
SKIMMER AND DRAGLINE WORK



## Tough Digging— Exacting Conditions

**U**NDER cramped working conditions, with street car, truck and automobile traffic on both sides, this Insley Skimmer, owned by the Kansas City Public Service Company, is digging up old track pavement. The material consists of an old concrete roadbed which is broken up by paving breakers.

It is hard material to handle, and the Insley is handling a daily average of 100 to 110 truck loads having a capacity of  $2\frac{1}{2}$  cubic yards each. Furthermore, it travels conveniently in a space only 9 feet wide.

The Insley Excavator, with any of its six attachments, can do any job economically no matter how hard the digging, or how exacting the conditions.

Write for Catalog No. 51

# INSLEY

MANUFACTURING  
COMPANY - Indianapolis



SHOVEL

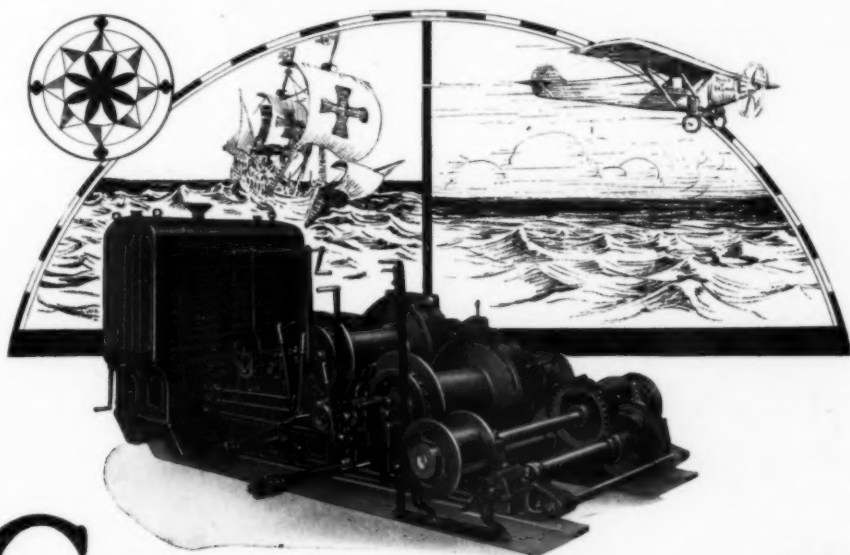


CRANE



DRAGLINE No. 529  
**ENGINEERS  
AND  
MANUFACTURERS**

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# Columbus sailed the ocean blue

TRADE MARK  
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ESTABLISHED 1869

## To Equipment Distributors

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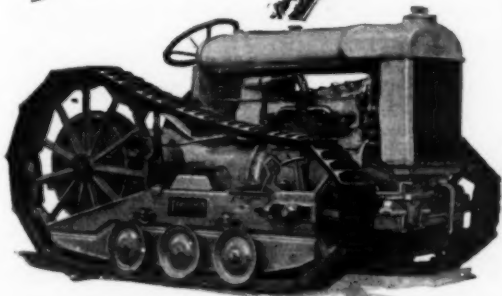
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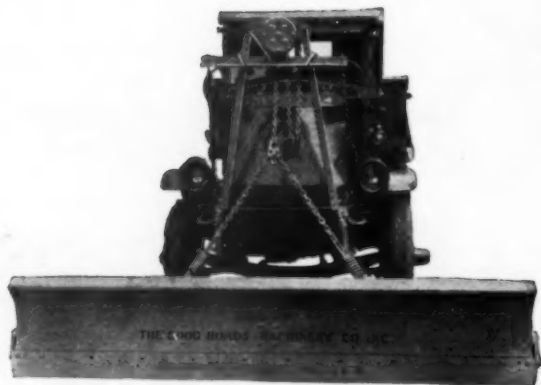
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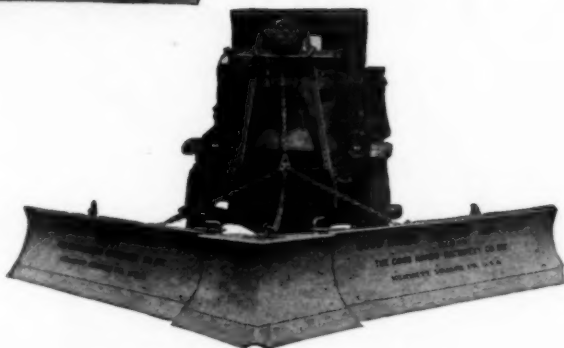
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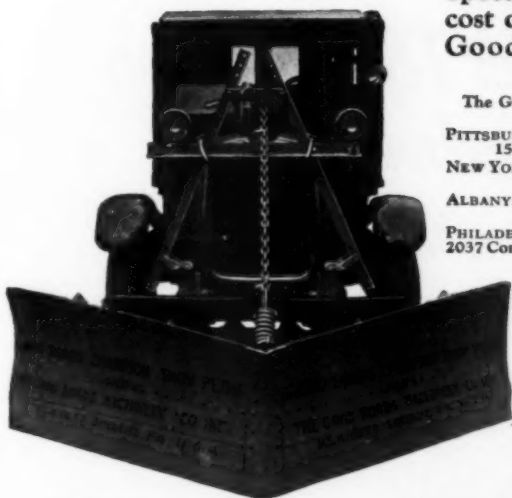
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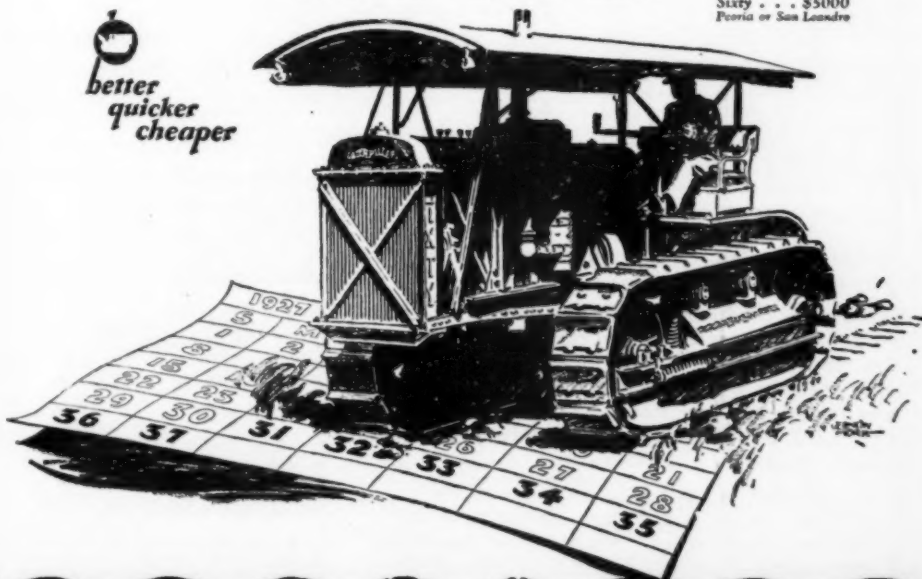
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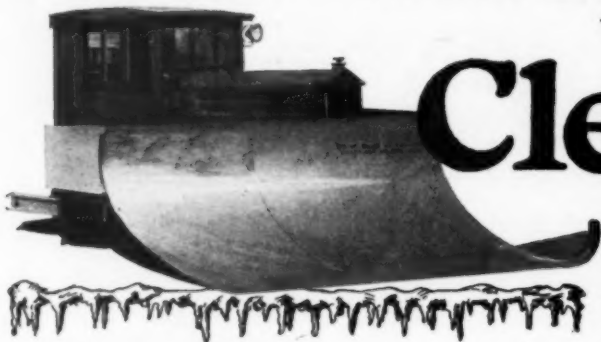
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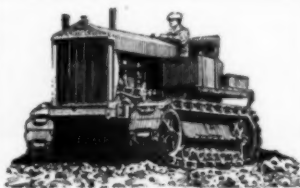
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## SPEED!



—SPEED built into the Koehring as never before in a crane!

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Wisconsin four cylinder gasoline engine, 5 1/4" x 6 1/2", 1,000 R. P. M.

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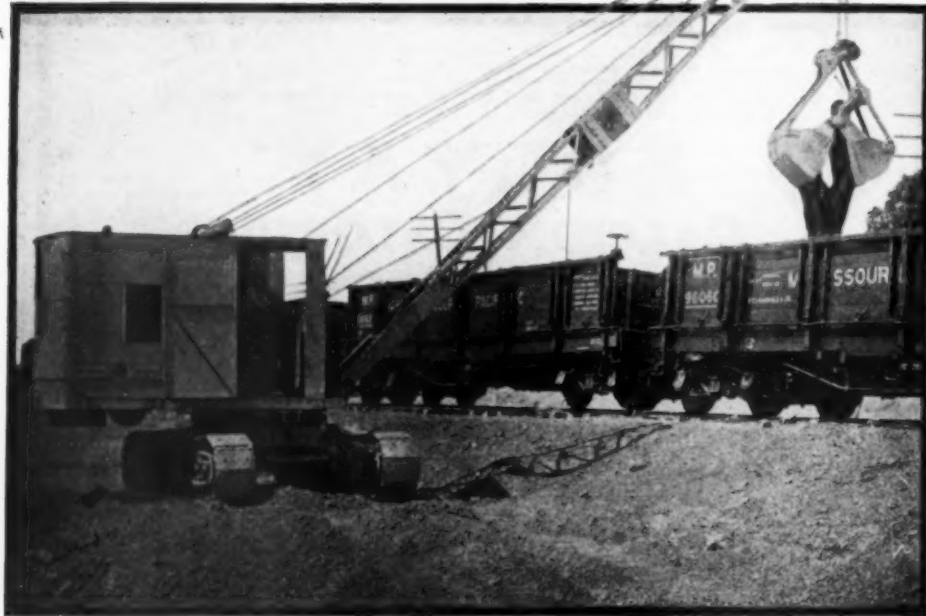
1 Yd. Bucket (weighing empty 3,950 lbs.) at 30' Radius, 45' Boom;

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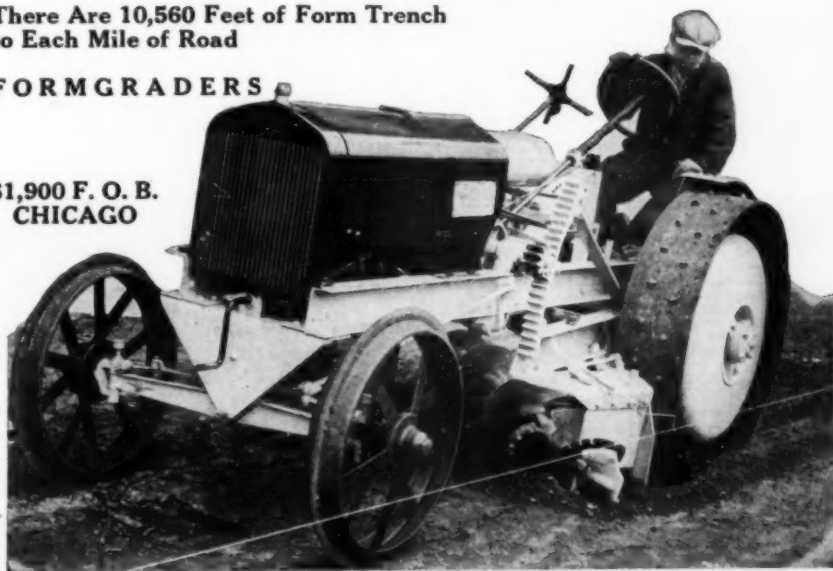
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939 West North Avenue  
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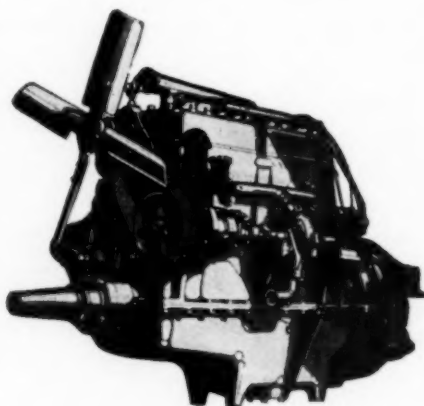
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Vol. XV

No. 4

# Contractors and Engineers Monthly

October,

1927

Published Monthly at 443 Fourth Ave., New York, by Buttenheim-Dix Publishing Corporation  
Branch Office: Tribune Tower, Chicago, Ill. Tom Dix, Vice-President; Prentice Ford, Western  
Advertising Manager; George Conover, Assistant Advertising Manager.

## TABLE OF CONTENTS

### Organization—Administration—Construction

A Contractor's Well-Planned Material and Equipment Yard.....	59
Arbitration Extends to Two More Important States.....	64
Building Buffington Harbor on Lake Michigan.....	65
Cost Data on Dirt Moving.....	69
Features of Construction of Pier 50 on the San Francisco Water Front.....	71
Quantity Surveys and the Owner.....	74
Outline for a Complete Builders' and Contractors' Local Organization.....	77
Blueswater-Toltec Irrigation Project.....	79
Novel Method of Obtaining Sand From Dunes.....	81
Demolition for Constructive Purposes.....	86
Construction of the Largest Oil Storage Reservoir Ever Built by a Railroad Company.....	106
How Connolly Moved 85,000 Yards of Sand and Clay in 65 Days.....	110

### Equipment and Materials

Electric Hoist Acts as Modern Hod Carrier.....	89
A New Subgrade Tester.....	90
A Machine That Puts the Cracks Where They Belong.....	91
Hydrometer Determines Moisture in Aggregate.....	92
A New Reversible Gasoline Hoist.....	93
A New Unit of Paint Spray Equipment.....	93
New Concrete Surfacing Tool.....	94
A Self-Propelled Portable Stone Crusher.....	95
A New Conveyor for Trencher.....	96
Dredging Engines for Heavy Continuous Service.....	97
A New Electric Melting Pot.....	97
A New Brick Unloader That Reduces Costs.....	98
New Concrete Highway Surfacers.....	99
Crawler Tractor Used in Difficult Conditions.....	99
New Machine to Replace Hand-Hoeing of Plaster.....	100
Unique Application of Ditcher in San Antonio.....	102
Tractor Converts Dense Forest Into a Golf Course.....	112
New One-Man Power Scrapers.....	114
Proper Protection and Curing of Concrete Floors.....	114
An Improved Motor Grader.....	116
A New 5-Ton Tractor.....	118
Locomotives for Road Building Transportation.....	120

### News, Notes and Helps

Front Cover Illustration.....	76
Gopher State Has Longest Concrete Road.....	78
Typical National Safety Council Posters.....	80
Well-Known Distributors of Construction Equipment.....	82
Officers of the Rogers Bros. Corporation.....	83
Current Business Conditions.....	84
Legal Points for Contractors.....	87
Management and Methods in Concrete Highway Construction.....	89
A Cietrac Plays an Important Part in the University of Michigan Stadium.....	90
\$250,000 Worth of Highway for \$1.00.....	94
Contractor Fined on Own Road.....	94
Strauss Engineering Corporation.....	95
Trackson Appoints New Distributors.....	95
Standardization of Replaceable Cutting Edges for Grader Blades.....	98
Origin of "Horsepower".....	98
New Snare Corporation Officials.....	104
Blaw-Knox New York City Office.....	104
Fair Represents Hales in Great Lakes States.....	108
The Burch Corporation.....	108
Climax Elects Officers.....	108
Made for Your Service.....	122
Directory of Consulting Engineers and Contractors.....	151
Directory of Distributors of Contractors' Equipment.....	155
Index to Advertisers.....	193



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SHIPPER shaft in center of the boom. Large circular steel bearings—bronze bushings—pinion and sprocket—all driven by a roller chain running in guides—these few oversize, extra-strong parts comprise the entire crowding mechanism of the Lorain 60 and 75 Boom.

Upon the design and construction of the Boom Structure and Crowd Mechanism rests the shovel's ability to dig further and dump higher. Thew—and Thew only has the Center-Drive Boom, giving the greatest ranges for given length of Boom and Stick. This is just another one of the reasons why Thew Sales show the largest increase in the entire industry.

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Vol. XV  
No. 4

# Contractors *and* Engineers Monthly

October,  
1927

## A Contractor's Well-Planned Material and Equipment Yard

*The Plant of R. C. Wieboldt Co., Chicago, Ill.*

THERE are so many well-planned features about the new equipment repair shops and storage yards of the R. C. Wieboldt Co., of Chicago, that a rather detailed description should prove of practical interest to contractors in general. It is distinctly a special purpose layout designed to fit the work that the company has in hand rather than a building that has been adapted to their purpose. In its old location there was always congestion on the yards and work was slowed down proportionally.

switch tracks.

It was decided that the plant layout should incorporate a heavy machinery storage unit, machine shop, warehouse, loading space and platforms, and office, wash rooms, etc. The accompanying plan shows the arrangement finally decided on. Any unit can be expanded without interfering with any other unit.

These units were built of certain types of construction primarily determined by the use, though fire insurance cost was also considered.

They are all fireproof. The machinery storage,

GENERAL  
VIEW OF THE  
R. C. WIEBOLDT  
EQUIPMENT  
REPAIR  
SHOP  
AND STORAGE  
YARD



In picking a new site the first move was to make a spot map of all the available locations of adequate size in the city of Chicago that were within four miles of the center of population, Madison Street and Ashland Avenue. In selecting the site they considered initial cost, switch track facilities, nearness to the main office, transportation facilities, distance from main thoroughfares, advertising value and possibilities for the property to increase in value. Their choice was a tract with a frontage of 655 feet on Blue Island Avenue, between Lincoln and Wood Streets. This property, containing 131,000 square feet, is served by two

machine shop, office, and loading space units are built of structural steel. The warehouse unit is of reinforced concrete and contains a basement and first and second floors.

As a preparation for designing the layouts, a representative of the company visited the plants of many leading contractors but, with a few noteworthy exceptions, he found that the problem of the contractor's plant layout had not been given the thought that it merited.

To bring operating costs of the new plant down to the lowest figure and also to take care of peak loads, a comprehensive study was made of the machinery to be installed. Here are the

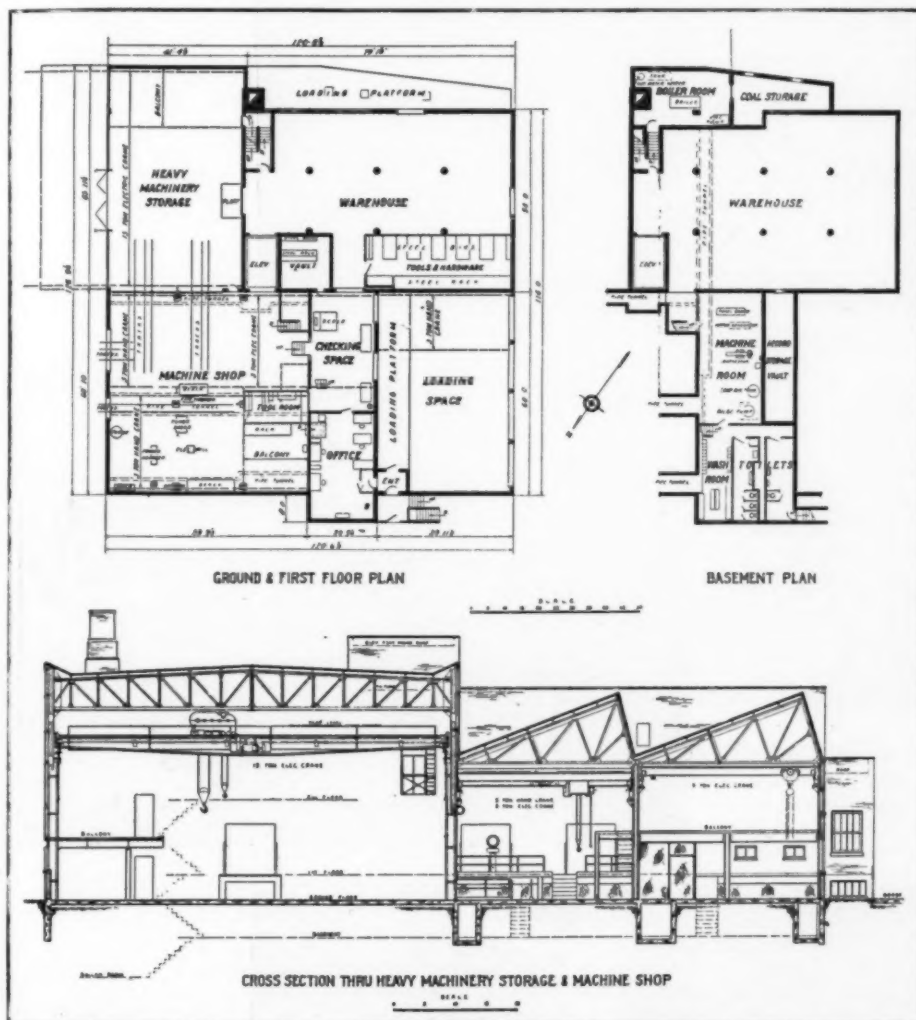




results of this study:

**Machinery Storage**—A 15-ton, 63-foot span, electric traveling crane with a 5-ton auxiliary crane for light loads. This crane extends through the end of the machinery storage and runs 200 feet over the yard space. This area

pairs to mixers and boilers. One mechanic, with the aid of this crane, can handle a boiler from a hoisting engine or a drum from a concrete mixer unaided. This crane also extends over the sorting area. By means of an area-way connected to the basement of the ware-



PLAN AND CROSS SECTION OF HEAVY MACHINERY STORAGE AND MACHINE SHOP OF R. C. WIEBOLDT CO.

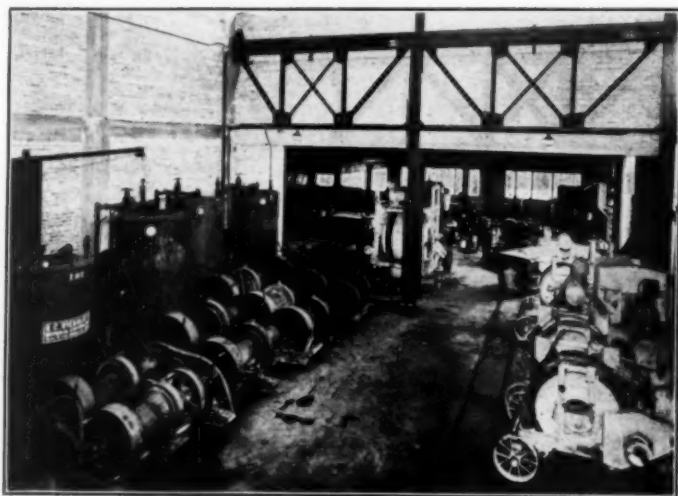
outside is used mostly for storing lumber and, with the use of the crane, the lumber handling costs have been trimmed 80 per cent.

**Machine Shop**—One-half of this shop is covered by a 3-ton electric traveling crane, floor operated. Here are made most of the re-

house unit, pumps, etc., can be wheeled right under it and lifted from the basement to the machine shop or sorting space, or vice versa. On the same craneway is a 5-ton, hand-operated crane, so there is no time lost waiting for service. A 3-ton, hand-operated crane covers



STEEL  
BINS FOR THE  
STORAGE  
OF REPAIR  
PARTS



MACHINERY  
STORAGE ROOM  
AT THE  
R. C. WIEBOLDT  
PLANT



THE  
TAEPAULIN  
STORAGE  
ROOM

the other half of the machine shop. This crane also covers a mezzanine floor at one end of the shop; here electrical apparatus and motors are stored and tested. A landing platform is provided. The electric crane can handle motors directly from the mezzanine floor to the sorting area for shipment on trucks or by cars, as the case may be.

**Loading Space**—A 3-ton, hand-operated crane covers half this area. Machinery is taken from the truck to the loading platform.

**Warehouse**—Here is a 10,000-pound capacity push button control elevator, with a platform 8 x 15 feet. It is big enough to handle any sort of equipment; it is used to convey gasoline concrete mixers, etc., to any of the warehouse floor levels.

The main piping work is all placed in tun-

The electrical control system is in the machinery room. The main panel board contains the controls for light and power. Leading from the main switch is a service switch by means of which all of the power and lighting circuits, with the exception of those feeding the bilge pulp, vacuum pump and night lights, can be shut off.

The work now performed at the new plant consists of the repair of all machinery and equipment, repair and sharpening of all small tools, manufacture of equipment, such as caisson rings, bull points, hoppers, etc., as well as stone anchors, pipe work and light structural steel work. The company's mechanics are sent out upon call to the various jobs to make any field repairs. A service truck takes care of these rush calls and carries a large stock of

**MACHINE  
AND REPAIR  
SHOPS**



nels, where it is readily accessible. There is a tunnel with a 6-foot head room leading from the boiler room under the basement floor of the warehouse unit and extending to the end of the machinery storage unit. Here are located the steam pipes. Under the machine shop floor are three tunnels containing heating pipes, main electrical feeders for the various machines, and the lighting wires therefor. The current for any piece of equipment can be shut off easily, without interfering with the operation of the others. Conduits are provided under the machine shop floor, making it easy to install new equipment without cutting the floors and without running exposed conduit. The tunnels also contain feeders for wall plugs for electrical outlets, both AC and DC, for testing equipment after it has been repaired, and for running portable drills, boiler tube equipment, etc. Here are also the compressed air pipes that terminate in the machine shop.

repair parts, jacks, tools, etc. The large stock of repair parts kept on hand covering every piece of machinery used eliminates any delay at the yard shop on the repairs and speeds up field repairs. The repair parts are kept in steel racks, all labelled. The stock room keeper is held responsible for everything therein.

On the second floor of the warehouse unit is a tarpaulin drying and repair room. Every tear is mended before a tarpaulin is sent out on another job. About one thousand tarpaulins are usually on hand.

The quantity of used lumber returned from the various jobs runs from 500,000 to 1,500,000 feet. This is handled mostly by the 15-ton electric crane. Lumber is graded, stacked and piled according to the various sizes and is separated into units of about 5,000 feet so that the crane can pick up a truck or trailer load from the pile and load it. A truck can drive under the craneway, receive its load, and leave

in a few minutes. Trailers are also used. These are loaded while the trucks are out.

There is always much lumber brought in that is not suitable for the average future jobs, such as short 4 x 4's, 4 x 6's, 8 x 8's, etc. A sawmill cuts these pieces into short 2 x 4's and wedges, which are always in demand. It is self-feeding and contains an inserted tooth saw so that it can be used in lumber containing nails. This saw will handle 85 per cent of the material to be resawed. Another saw for taking care of large timbers will be installed.

Hoppers, concrete buckets, buggies and chutes are stored under one of the 10-ton electric stiff leg derricks, so that none of the machinery, tools and equipment is handled by hand. When a 10-ton electric traveling crane of 60-foot span is later installed, the yard space will be covered by the two cranes and the stiff legged derricks dispensed with.

The company has always made it a practice to own its equipment and so keep it under its

individual control, rather than rent it. An accurate record of the cost of repairing and maintaining each individual machine is kept so that at any time it can be determined whether it is cheaper to own than to rent any particular piece of machinery. All equipment must receive the O. K. of the master mechanic before it is sent out to a job. Pumps are tested under as nearly actual conditions as possible, taking into consideration both head and volume of water.

The company will soon build a wood shop for the manufacture of concrete form work. Other improvements will help eliminate much work now done on the job.

In addition to the construction of the buildings, it was necessary to fill in over the entire area and raise the grade three feet. The total investment, including land, buildings, and equipment, is about \$350,000. This does not, of course, include the machinery, tools, supplies and equipment which are kept for use on the different jobs.

### Arbitration Extends to Two More Important States

THE area for the amicable settlement of commercial disputes has been extended to the states of California and Pennsylvania this year, as the result of the enactment of comprehensive arbitration laws at the legislative sessions just ended, according to an announcement issued by the American Arbitration Association.

From the standpoint of interstate and international trade, these two great coast states, with the important shipping centers of Philadelphia and San Francisco, are of strategic value to the development of arbitration and the promotion of commercial peace and economic stability.

Nearly all of the commercially important seaboard states—New York, New Jersey, Massachusetts, Pennsylvania, Oregon and California—now recognize the validity, enforceability and irrevocability of agreements to arbitrate disputes that may later arise out of business contracts, as well as submissions to arbitration of existing controversies.

The standard arbitration clause recommended by the American Arbitration Association and enforceable in the above states is as follows:

"Any controversy arising from or concerning the transaction of which this contract is a part shall be settled by arbitration and judgment may be entered on the award in any court having jurisdiction."

The rapidity, economy and impartiality by which disputes may be settled through the enactment of these laws as against the length of time and expense involved in taking such disputes through the usual court procedure, are convincing arguments for their adoption in other states. The new laws provide a policy and procedure for the arbitration of intrastate disputes which is in complete accord with the national policy for interstate com-

merce, as expressed in the Federal Arbitration Act which became effective on January 1, 1926.

The arbitrators have the power to hold hearings, summon witnesses and order the production of books, records and documents; and, if necessary, the court will compel attendance of witnesses and the production of books. If the award is not performed voluntarily, any party to the arbitration may apply to the court for an order confirming it.

The American Arbitration Year Book for 1927, issued by the Association is the first of its kind in this country and gives a complete picture of the state of commercial arbitration in the United States. It contains reports on the arbitral activities of the United States Departments of Commerce and of Agriculture, of 409 trade and professional organizations, 51 Chambers of Commerce, and various other organizations which promote arbitration. It tells when and how business men can secure arbitration in their particular trades, what it will cost, what rules will govern the decision, and the steps to be taken to put the award into effect. It includes reports on about 100 trades and professions, among them being: building, construction, contracting, engineering, machinery, manufacturing, quarrymen, plumbing, etc. It has a foreword by Herbert Hoover. It is a book of 1152 pages, bound in cloth, and may be procured from the Association for \$7.50 plus 25 cents additional postage. Special prices are made to trade associations when ordered in quantities of six or more for distribution to members.

Headquarters of the American Arbitration Association are at 342 Madison Avenue, New York, N. Y. Lucius R. Easton is President, and J. Noble Braden is General Secretary.



## Building Buffington Harbor on Lake Michigan

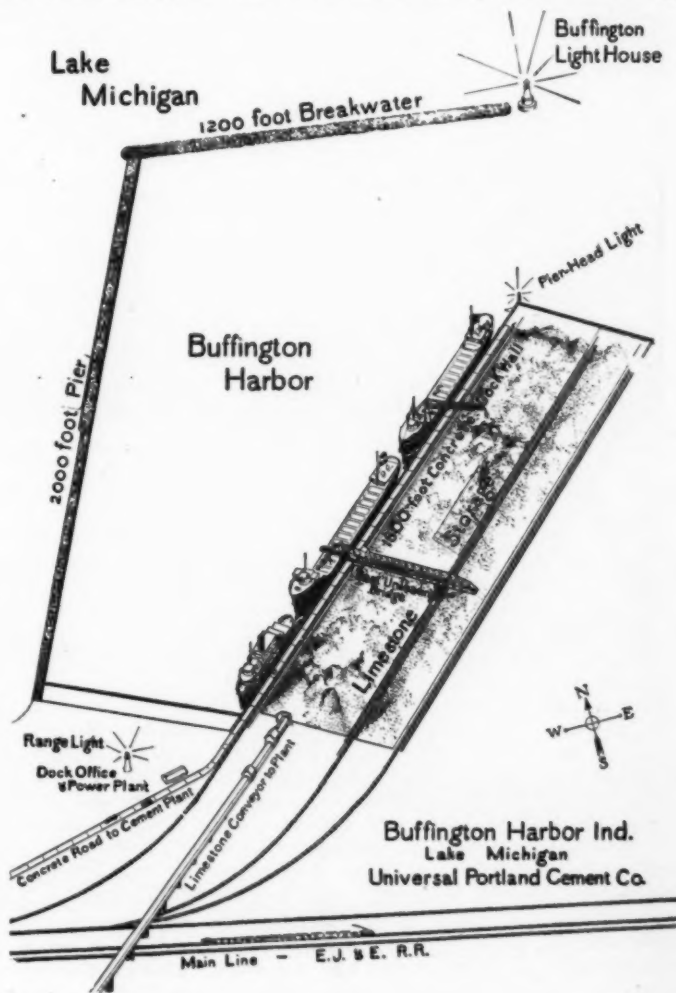
### Construction Features Briefly Outlined

A PRIVATE industrial harbor, one of three such harbors on the Great Lakes, has recently been completed by the Universal Portland Cement Co. at its Chicago (Buffington, Ind.) plant. Buffington is located at the south end of Lake Michigan about halfway between Indiana Harbor and Gary Harbor. The harbor was built to serve two purposes: First, the shipment by boat of portland cement, and second, the receipt of limestone for the manufacture of cement. The limestone used at the plant comes from the Calcite, Mich., quarry of the Michigan Limestone and Chemical Co., the

world's largest quarry. The stone is brought to Buffington Harbor partly by the self-unloading steamers of the Bradley Transportation Co. and partly by the standard steamers of the Pittsburgh Steamship Co., both controlled by United States Steel Corp. The harbor was therefore designed and equipped to handle the unloading of standard steamers as well as receipt of stone by the self-unloaders.

The site of the harbor is the soft sand beach, the bottom sloping from the water line out to deep water on a grade of approximately 1 per cent. The harbor basin, which is about 55

PICTORIAL  
PLAN OF  
BUFFINGTON  
HARBOR  
SHOWING  
UNLOADING  
EQUIPMENT



acres in extent, opens to the northeast with a clear entrance 500 feet wide and is enclosed on the north side by a rubble mound breakwater, on the west side by a rock-filled pile pier, on the south side by a line of sheeting rip-rapped with heavy stone and on the easterly side by a concrete dock which forms the westerly wall of the storage pier.

The breakwater is 1,200 feet long and approximately 33 feet wide at the water line and about 115 feet wide at the base. The core was made with quarry-run stone placed by dump scows. The side slopes of the core were covered to a depth of about 8 feet with heavy stone weighing from 2 to 5 tons each. The space between the shoulders of the rip-rap was shaped up with leveling stone and the whole was cap-

feet at the inner end. The stone fill was brought to the site by dump scows and placed in the pier by a dipper dredge.

The condition known by lake navigators as undertow exists to a certain extent in many of the harbors on the Great Lakes. When the sea is running, the reaction from the closed end of the harbor basins causes steamers to surge backward and forward against the mooring lines and, when this action is at all pronounced, unloading is difficult or impossible. To prevent the reaction from the harbor end, the end wall was built of a line of Wakefield sheeting rip-rapped on the harbor side with heavy stone. The rough sloping beach thus formed breaks the waves to such an extent that the undertow is almost entirely prevented.



STORAGE PIER NEARING COMPLETION, MARCH 18, 1927, SHOWING BELT CONVEYOR STRUCTURE IN FOREGROUND

ped with heavy blocks of Bedford limestone weighing 7 tons or more each.

The easterly end of the breakwater terminates in a concrete lighthouse which is supported by a circular crib 30 feet in diameter, built of interlocking U. S. steel piling filled to the water level with quarry-run stone and capped with concrete 3 feet thick. On this foundation the concrete lighthouse was built, the lower section of which forms a shelter for the air compressor for the fog-horn which is installed near the top of the lighthouse shaft. There is also a storage room for the acetylene tanks in the lower part of the structure. The light, which is a 4,000-candlepower electric light, is provided with an acetylene burner for emergency purposes.

The rock-filled bulkhead, 2,000 feet long on the west side of the harbor, is built of close-driven hardwood piling 45 feet long, the width varying from 20 feet at the outer end to 15

### Storage Pier

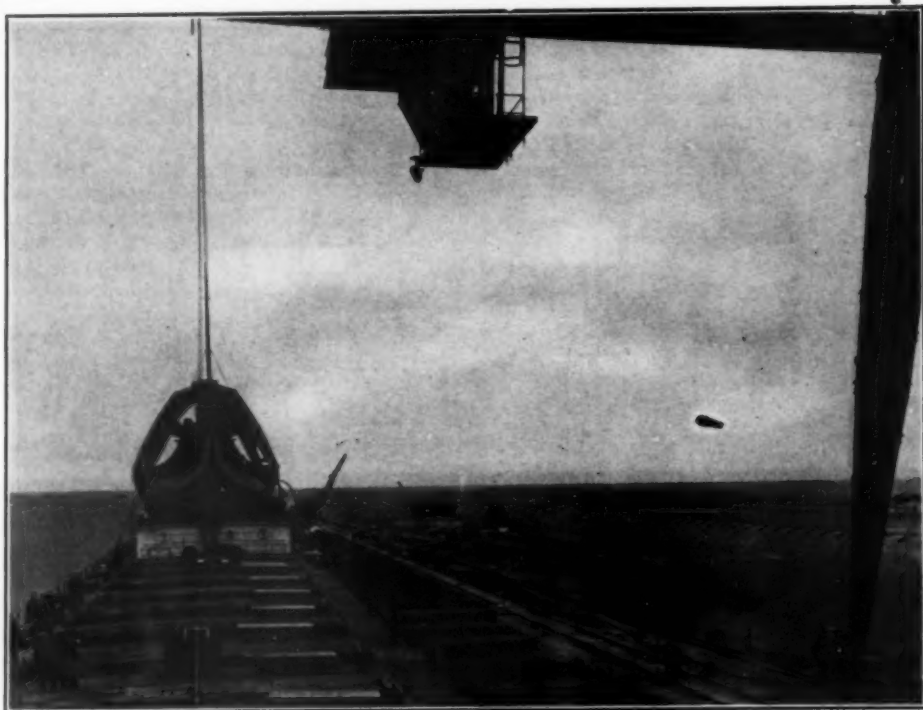
The tonnage of limestone used by the plant during the closed season of navigation is large and it was therefore necessary to provide storage for about a million tons of stone. This storage is on a pier 600 feet wide and 1800 feet long built into the open lake to the east of the harbor basin.

The dock wall which forms the west side of the pier is a concrete superstructure carried by three rows of piling with a line of 40-foot-long Wakefield sheeting between the first and second rows of piles. The concrete superstructure is 8 feet high and 10 feet wide at the base and the back of the wall is stepped off to the top, which is 5 feet wide.

Concrete for this wall was controlled by the water-cement ratio method, a maximum of 6 gallons of water per sack of cement being allowed. The mixer was sampled twice daily and cylinders were made for 3-, 7- and 28-day



THE BUFFINGTON HARBOR BREAKWATER, STONE FOR WHICH WAS PLACED BY A DOUBLE END FLOATING DERRICK. EVERY STONE IN THE CAPPING WEIGHS AT LEAST TEN TONS



**THE FIRST CARGO BEING UNLOADED BY THE 10-TON BUCKET AT BUFFINGTON HARBOR**  
Steamers were received before the concrete tunnel, seen at the right, was completed

tests. The average strength for 3 days was 2500 pounds; 7 days, over 3700 pounds; and 28 days, over 5200 pounds per square inch in compression. The concrete was mixed in a one-yard mixer which was set on a flat car fitted with measuring hoppers and sand and gravel bins. The material bins were filled by a locomotive crane and clamshell bucket. Sacked cement was lifted to the charging platform by means of a special bucket elevator driven by the counter shaft from the driving gear on the mixer. A receiving hopper was placed under the discharge chute of the mixer which deposited the concrete on a 24-inch belt conveyor on a structural steel boom. The belt was driven by a gasoline engine mounted on a platform at the heel of the boom. The concrete was mixed with very little slump much stiffer than could be chuted, and the belt conveyor was therefore adopted as the best means of filling the forms.

The outer face of the wall was formed with steel plate. The plates were heavy, being a quarter inch well reinforced with stiffening angles. The outer bottom corner of the dock wall is protected with an 8 by 8-inch steel angle spiked to the waling piece on the sub-

structure. The steel forms were clamped to this angle by hook bolts which were burnt off with an acetylene cutting torch after the forms were stripped.

The east side of the pier is held by a bulk head of steel mill slag which was dumped from a temporary wooden trestle driven out into the open lake. The northerly or outer end of the pier is bounded by a temporary rock-filled pile bulkhead.

The harbor basin was dredged by a suction dredge which deposited the spoil inside the storage pier. Cut and fill were very closely balanced so that only a small amount of extra sand had to be borrowed to complete the filling of the storage yard. The harbor was dredged to a sufficient depth to accommodate steamers drawing 23 feet.

The storage pier is served by a movable bucket-handling bridge which carries a clamshell bucket of 10-ton capacity. The weight of this bridge is 850 tons and the main dimensions are:

Center span .....	385 feet
Over-all length .....	634 feet
Height from track rail to trolley rail .....	70 feet
Traveling speed .....	75 ft. per minute
Trolley-traveling speed .....	800 ft. per minute
Hoisting speed .....	150 ft. per minute

The bridge was erected on the original beach north of the storage pier and was run out to its permanent tracks on its own power after completion, over a temporary track laid on a thin concrete slab. The bridge erection was handled by a stiff-leg tower derrick.

A concrete tunnel 1,200 feet long and 140 feet from the face of the dock and running parallel to the dock line was built under the storage yard. The stone, as needed in the mills, is drawn through gates in the roof of this tunnel and carried by a series of belt conveyors to the points of consumption in the plant. The

capacity of the conveyor system is 350 tons of stone per hour.

The construction of the harbor basin, pier and concrete tunnel was done by the Great Lakes Dredge and Dock Co., Chicago. The bucket-handling bridge, fabricated by the American Bridge Co., was erected by the Mead-Morrison Manufacturing Co., Chicago. The belt-conveyor machinery was furnished by the Robins Conveying Belt Co., Chicago. The design of the harbor and supervision of the work were under the Engineering Department of the Universal Portland Cement Co.

## Cost Data on Dirt Moving

### *Equipment Gives Satisfactory Results on Subdivision Work and Saves Thousands of Dollars Annually*

**I**N the subdivision street grading, excavating and filling work done by Ferwerda Bros. of Maple Heights, Cleveland, Ohio, two Cletrac "30" crawler-type tractors are used. Each tractor draws two or more 1¼-yard Euclid drag scrapers giving a higher earth moving capacity and lower cost per yard than any method formerly used by these contractors.

A survey made by A. C. Nielson Co., 4450 Ravenswood Avenue, Chicago, Ill., shows that the grading costs have been reduced from 37.6 cents to 20 cents per yard of earth moved by the new method. The typical working unit of these contractors consists of the two tractors, four drag scrapers, and an old wheel-type tractor converted to the crawler type, on which is mounted a special back filler and plow attachment.

The tractors go on the job first, each draw-

ing two or three scrapers to remove the over burden of sod and top soil. The converted wheel-type tractor follows, using the plow attachment to break up the hardpan. The plow is mounted on a special rig developed for this work. This operation is not absolutely essential; the tractors and scrapers are capable of removing the hardpan if this is desired. Ordinarily, two 1¼-yard scrapers carry from 1¾ to 2 yards per trip and, when working in loose moist soil, the combined haulage per trip often exceeds 2½ yards. The operating crew includes a foreman, two tractor operators, two scraper men, and one man to operate the converted tractor and handle the back filler and plow attachment.

On a 400-foot cut, recently completed, in which the average depth was about 9 feet, this working unit handled a total of 8,600 yards in sixteen 10-hour working days, hauling to dumps from 100 to 400 feet from the cut. The average haulage on this job was 537 yards a day.

At present, this unit is operating in a 50-foot street about 2,000 feet long, making cuts of ½ to 3¼-foot depth and making hauls of 50 to 200 feet to the dumps. The material, a hard packed clay, is being handled at the average rate of 500 yards per 10-hour day. In a recent 2-day hauling, during which hauls averaged about 100 feet, a total of 1,250 yards, or 625 yards per 10-hour day, was estimated.

This is a vast increase over the results obtained by former methods employed by this company. Previous to the adoption of the present equipment at the beginning of the 1927 season, wheel-type tractors were used with ¾-yard wheel scrapers. One man was used on each tractor-scraper unit and the plow arrangement was used to break up the hardpan



CLETRAC "30" TRACTOR WITH EUCLID 1¼-YARD TRAILER ON SUBDIVISION WORK DONE BY FERWERDA BROTHERS, MAPLE HEIGHTS, CLEVELAND, OHIO





TWO  
CLETRACS  
HANDLING FOUR  
1¼-YARD  
EUCLID  
DRAG SCRAPERS  
AT  
MAPLE HEIGHTS,  
CLEVELAND,  
OHIO

The average haulage over a full season did not exceed 50 yards per unit per operating day. The wheel-type tractors were unable to pull a single ¾-yard scraper in moist ground, the units were difficult to handle and the scrapers gave trouble, frequently due to broken cables. It is estimated that ten of this type of tractor with the scraper, aided by the plowing machine, could possibly do the work now being handled by the present equipment. This is based on the comparison of earth moving costs in the present and former methods.

In this comparison fixed charges are made separately for the tractors, the drag scrapers, and the tractor-plow equipment. Depreciation is figured on the basis of a 3-year life for all machines, and average interest on the money invested is set up on a 6 per cent basis. Liberal upkeep allowances are made in all cases, as it is the policy of the owners to make repairs in a thorough-going manner and to maintain all equipment in good working shape at all times. Fixed charges are distributed over a working period of seven months of twenty 10-hour days each. The items of operating costs consist of lubrication and gasoline on the power units and labor for tractor, scraper and plow operation.

By this analysis, one Cletrac "30" unit costs \$25.66 per day to operate, the two units in use showing a total cost of \$51.32 per day. The Euclid scrapers, on which only fixed charges and labor are made, cost \$5.82 each per day, or \$23.28 per day for the four. The plow unit costs \$16.60 per day and the foreman's time,

charged as supervisory and maintenance overhead, costs \$9.09 per day. Thus, the total cost for all equipment included in the working unit now used is \$100.29 per day.

Detailing the costs for the former equipment used by this company by the same method of analysis, the total daily cost for ten wheel-type tractor units was \$145.10. Ten ¾-yard wheel scrapers cost \$17.30 per day. The costs for the plow unit and for the foreman's time are considered to be the same as at present although it is evident that the foreman would be working to less advantage with eleven men and twenty-one pieces of equipment to supervise than he now is with five men and seven pieces of equipment. Then, the total of all costs for an outfit of the old type equipment capable of handling 500 yards of material in 10 hours is \$188.09 per day.

A calculation of handling costs per yard of earth moved shows the size of the saving being made by present methods. The unit cost by the former method being 37.6 cents per yard and the present cost 20 cents per yard, the net saving of 17.6 cents per yard shows a cost reduction of 46.8 per cent. The net daily saving, taken as the difference between totals obtained in the analyses above, is \$87.80. The annual saving, in a year of 140 operating days, is \$12,292.00. This pays a net annual return of 153 per cent on the total first cost of two of the tractors and four scrapers of the kind used here, and returns this entire cost in a little less than eight months of operation.

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*Did you ever think of it in this way? Your success—whatever of that you may have enjoyed up to now—has been made possible by those who believe in you. If you have done something worth while, you have probably made some enemies. Pay no attention to them. Think only of those who believe in you. Then you will do your best. And if you are giving the world a square deal and your purposes are right, those who have faith in you will help you accomplish them.—M. H. ALEXANDER.*

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## Features of Construction of Pier 50 on the San Francisco Water Front

### *Precast Reinforced Concrete Jackets Used to Protect Piles*

THE Port of San Francisco is the industrial and commercial center of the Pacific Ocean. It is the great American hub of trade on the Pacific, and, in direct proportion as the development of this coast has unfolded, so have the facilities of this great harbor been developed to meet without stint every requirement.

Twenty years ago the Port of San Francisco and the water front was developed more or less intensively from Battery and Lombard Streets on the north to Berry Street on the south. There were a few small wharves along Channel Street and in Central Basin. The permanent seawall was constructed only in

terminals are being provided.

The permanent seawall extends from Hyde Street to the Channel and is paralleled for almost the entire distance with a reinforced concrete apron wharf. The piers are larger and number forty-three.

The latest project to be completed on the San Francisco water front by the California Harbor Board was Pier 50. This pier is 386 feet in width and 600 feet in length and is equipped with two separate transit sheds, between which is a depression in which are located three railroad tracks and two driveways. One depressed track is provided along each shed and the third is used as a running track.



YARD FOR CASTING THE REINFORCED CONCRETE JACKETS FOR THE WOODEN PILING AT PIER 50

part. There was a small section completed between Taylor Street and Mission and a short section at the foot of Berry Street. There were no wharves paralleling the water front between Taylor and Lombard Streets and those in existence were of the old timber type of construction. There were only thirty-three of these commercial piers exclusive of the smaller structures in Channel Street and Central Basin. Narrow piers predominated, only six being more than one hundred feet in width. Apparently the need for covered space was less at that time, only seventeen of the piers having covered sheds.

In comparison, the water front of 1927 is developed intensively for commercial purposes from Hyde Street on the north to Channel Street on the south. In addition, commercial piers have been constructed along the China Basin front south of the Channel and considerable development has been started in the Islais Creek District, where grain, oil and lumber

Between the outer side of each shed and the edge of the pier are two flush tracks. In conjunction with the pier there was constructed a section of permanent bulkhead wall and wharf 806 feet in length and from 55 to 65 feet in width. The aprons carrying the flush tracks along the edges of the pier are constructed of creosoted timber on creosoted piling. The remainder of the construction is of reinforced concrete. The supports consist of wooden piling covered and protected by precast reinforced concrete jackets, which it is believed will provide permanent protection against marine borers. Frank G. White, Chief Engineer of the California State Harbor Board, designed the precast reinforced concrete jackets. The conditions here were ideal for this type of construction, as the bottom is of such a nature that piles from 70 to 90 feet in length are required, while the precast concrete jackets are only from 26 to 41 feet in length. In previous work by this method the wooden piles were



**METHOD  
OF REMOVING  
STEEL  
FORM SHOWING  
CONNECTING  
BLOCK AND  
TACKLE**

driven tip down as is the usual custom. In Pier 50, however, they were driven butt down. This gave increased bearing value and permitted the using of jackets 4 and 16 inches in inside diameter instead of 18 to 20 inches as would have been necessary if they had been placed over the butts of large piles. It also facilitated the introduction of pipes for pumping and grouting. The precast jackets are circular on the inside and octagonal on the outside, the corners being chamfered on a 4 inch bevel. Two sizes of jackets were used depending on the length, the minimum outside dimensions being 20 and 22 inches and the minimum thickness of shell 3 inches. The reinforcement consisted of  $8\frac{1}{2}$  inch square deformed bars spirally wrapped with No. 6 wire on 4 inch pitch. The longitudinal bars protruded two feet for bonding into the deck structure.

The concrete consisted of one part of cement to  $4\frac{1}{2}$  parts of graded aggregate. It was mixed fairly dry and was thoroughly tamped and spaded after being deposited in the forms. The jackets were kept covered with wet burlap for two weeks and were not handled for 30 days after being cast. As they were set in position over the wooden piles, the mud was forced

out by means of a gasket made of old rubber hose, after which they were sealed by grouting under water. When this grout had set, the space between the jacket and the pile was pumped out and filled with concrete. The deck is of reinforced concrete construction.

As the relative lengths of the jacket and pile approach each other due to bottom conditions a point is reached at which it is more economical to omit the wooden core and use a solid concrete pile.

Based on the contract price for Pier 50 the following unit costs of precast jacketed piles are presented:

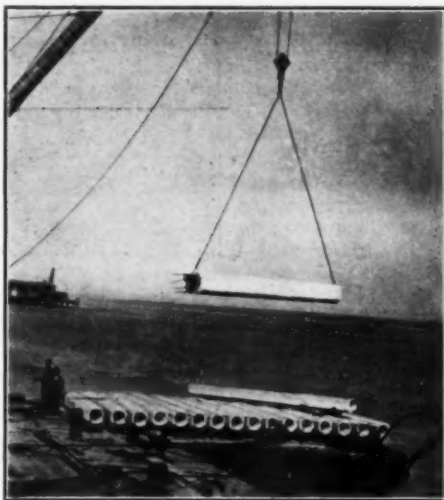
Cost of 20-inch jacket per lineal foot.....	\$1.95
Cost of concrete fill per lineal foot.....	.26
<b>Total .....</b>	<b>\$2.21</b>
Cost of 22-inch jacket per lineal foot.....	\$2.17
Cost of concrete fill per lineal foot.....	.37
<b>Total .....</b>	<b>\$2.54</b>
Cost of pile per lineal foot.....	\$1.307
Driving pile and setting jacket—each.....	\$13.70
Cost of 85-foot wooden pile with 20-inch jacket 30 ft. in length, pile 85 ft. @ \$0.307.....	\$26.09
Jacket 30 feet @ \$2.21.....	66.30
Drive and set pile and jacket.....	13.70
	<b>\$106.09</b>
Cost per lineal foot in place.....	\$1.25

**FORDSON  
TRACTOR WITH  
WINCH  
FOR  
REMOVING  
STEEL FORMS  
FROM  
CONCRETE  
JACKETS**



In the accompanying photographs showing the method of casting and handling the precast concrete jackets one shows a general view of the yard. A Fordson tractor and 2-wheel trailer carried the concrete from the mixer to a hopper. From this hopper the concrete was drawn into the 2-wheel buggies used in carrying the concrete to the forms. This hopper is shown at the arrow in the photograph. A Fordson tractor was also used in removing the center form. A block and tackle was attached to one end of the metal form and by means of a drum mounted on a Fordson tractor the form was pulled from within the jacket. For handling the precast jackets from the point where they were cast to the point where they were to be lowered down over the wooden pile a large timber, firmly attached to the end of a heavy cable, was inserted into each end of the jacket. The jacket was then lifted by a floating derrick and lowered onto the deck of the barge carrying the derrick. When a sufficient number of the jackets had been loaded onto the barge it was towed to the point where the jackets were to be used. Here the jackets were picked up and lowered over the wooden piling, the wooden piling having been previously driven by a pile driver. Longitudinal reinforcing bars protrude two feet above the upper end of the jacket for bonding into the deck structure. The concrete jackets penetrate the bottom of the bay a sufficient distance to insure that the wooden piles will not be exposed by subsequent dredging or scour.

The concrete deck was constructed of concrete proportioned 1 part cement to 5 parts aggregate. The pile caps and deck slab were poured in one operation. The concrete curtain wall along the bulkhead wharf was constructed of pre-cast concrete slabs, the concrete being proportioned 1 part cement to 5 parts aggregate, and the slabs were not handled until thirty



**METHOD OF HANDLING JACKETS FROM CASTING YARD TO PIER**

days after being cast. They were handled with every precaution to prevent cracking. A special steel frame was attached to the rear of a Fordson tractor, which carried a boom, the cables being operated by double drums at the rear of the tractor. The precast slabs were approximately 5 x 20 inch in size, weighing from 1 to 3 tons. The slabs were built as ribbed panels, fastened to the frame by bolts and laid in mortar beds.

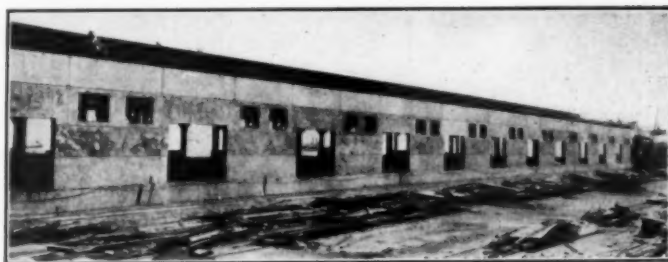
The shed front walls are of reinforced concrete cast in place with galvanized steel sash and steel rolling doors. Each of the two transit sheds is 674 feet in length and 115 feet in width. It is expected that Pier 50 will eventually be connected to Mission Rock.

Out in the bay, about 200 feet east of Pier 50 is a privately owned tract of about ten



**DRIVING  
BRACING  
PILING  
AT  
PIER  
50**

ERECTING  
THE PRECAST  
WALL  
SLABS  
BY MEANS  
OF TRACTOR  
WITH  
SPECIALLY MOUNTED  
DERRICK



acres which is known as "Mission Rock," the top of an ancient upheaval of nature surrounded by very deep water, and easily connected to the Embarcadero. State harbor authorities have planned through many administrations to add this property to the state's control of all acreage within the pierhead lines. Some time ago the corporation owning "Mission Rock" submitted to the Harbor Commission a leasing proposition to connect Pier 50 with the ancient bay landmark and make it a great shipping terminal and industrial siding, at a cost of about \$8,000,000, providing addi-

tional facilities demanded by fast-growing commerce, and industrial sites for many new activities, providing bulkheads for berthing eight large ships simultaneously. The cost of the improvement will be advanced by the company in a leasehold contract, extending over a period of years, the cost of the extension to be returned as rental rebate. Dockage and cargo totals will be paid to the State Harbor Board. This is one of the most important proposals ever brought to the attention of the Harbor Board and is receiving careful consideration.

## Quantity Surveys and the Owner

By OSCAR EUPHRAT

Euphrat and Hanly, Structural Engineers, Cincinnati, Ohio

**M**EN engaged in the construction industry and the public are becoming more and more convinced that the introduction of a General Quantity Survey System is not only desirable and necessary but imperative, because of the unscientific, unfair and wasteful existing methods of arriving at an agreement or contract between the contractor and owner. That the eventual and ultimate establishment of such a system will come about is only a question of time, because it is a scientific, logical, sensible, ethical and fair way of doing business between the contractor and owner, whereas existing methods are not all of these.

Of all parties concerned in the General Quantity System the owner is the one most vitally interested and also the one who knows least about it. The owner is the most interested party because he pays for the waste the present method entails.

When the owner undertakes a construction project he first engages an engineer or architect. When plans and specifications are finished he invites bids or proposals from the contractors. The owner is now a buyer who desires to buy some construction, and the contractor a seller who is asked to quote a price

on that construction. Of course, the owner asks more than one contractor to quote such a price, and usually a minimum of three or four and a maximum of fifteen to twenty. The contractor in question is the one who is known as the general contractor. Here is where the useless waste of the owner's money begins. The general contractor buys a copy or several copies of plans and specifications, and in turn asks a usual minimum of sub-contractors to quote a price for some particular specialized branch of construction. The sub-contractor then buys some more copies of plans and specifications. The next step is the preparation of quantity surveys by the general contractor and sub-contractor as a necessary preliminary to making his quotation.

The general contractor's survey consists of those specialized branches of the construction which he himself executes, together with a more or less approximate survey of some of the branches which he does not execute but which he expects to buy from the sub-contractor specialist. The extent to which the general contractor does this latter depends largely on the location of his business and customs of the industry in that locality. The sub-contractor's



quantity survey embraces only that branch of work in which he specializes.

In due time the owner receives a bid or quotation from each of the general contractors. Up to this point the money and time expended, not in a reasonable or logical manner, but in a vast duplication of effort, is enormous, because there will have been made quantity surveys of general contract branches by all general contractors asked to quote prices by the owner together with quantity surveys by all sub-contractors who have been asked to quote by all general contractors collectively.

It is conservatively estimated that the cost of the surveys thus made is  $2\frac{1}{2}$  to 3 per cent of the cost of the project under consideration, and of this amount 2 to  $2\frac{1}{2}$  per cent is due to duplication, and is absolute waste and for which the owner pays the bill. It is difficult to make the owner believe this, because so far he has not had to write out a check, and says, "I don't pay, it's the contractor who pays, and judging from the way he solicited an opportunity to quote a price he must be glad to pay and evidently has no worries at all about it." The owner is wrong, because he does pay and the contractor knows that he, the contractor, does not pay, and the owner does. The owner, in his own business, has a certain indirect or overhead expense which is not paid for by his buyers as such, but which is surely and inevitably included in the selling price. So does the owner pay the cost for the duplication and waste caused by so many quantity surveys, as that cost, which is an indirect or overhead expense in the contractor's business, is certainly included in the general contractor's and sub-contractor's selling price.

It would be difficult to bring about the adoption of the general quantity survey system through the owner at the present time. One owner may engage a competent quantity surveyor to prepare one quantity survey of each branch of work for the use of all bidders invited to submit proposals, while other owners

may not be willing to do this, thereby increasing the burden of one owner as against the others even though in the long run all owners would be benefited.

The easiest and most logical way to bring about the system is through and with the contractor. Next to the owner he is the most interested party, because it would eliminate that serious, unfair element of competition in his business, the competition in quantity. Under this system the contractor would meet his competitor on the same basis that the owner meets him; that is, on the basis of quality and price.

To a certain extent the contractor is lending his assistance and support to the introduction

of this system. It is well known that through his trade association he is urging the use and adoption of a quantity survey system, through and by which more contractors each year are learning of the increased efficiency and of the stabilizing influence of quantity surveys in the construction industry. In most cases the Contractors Trade Association does not advocate, in fact frequently opposes, the general survey system, and rather advocates and urges strongly the establishment of what might

### Quantity Survey System Defined

*By a General Quantity Survey System, we mean a system whereby a contract or agreement between the owner and contractor is based on a quantity survey, prepared by some recognized competent agency at the expense of the owner and furnished to the invited contractor together with plans and specifications. Under such a system the owner pays for all professional service he incurs, such as service for plans and specifications, service for a quantity survey and also for all material or goods he is to receive under the contract, such as brick, stone, steel, etc. In other words, the owner, under such a system, gives to the contractor a bill of goods he desires to buy and the contractor quotes a price on this bill of goods.*

be called an association quantity system. Under this system the survey is made and paid for by the association and furnished to members only. Should this system be adopted, the contractors would still have competition in quantity outside the association. The owner would still pay, although in somewhat lesser degree, for duplication of quantity surveys and resultant waste.

This association system has grown in popularity in the past few years, as is attested by the fact that where formerly there was practically unanimous objection to any quantity system, there is now a unanimous sentiment for the association system, and I am firmly convinced that the contractor will abandon this latter system when he is convinced that the General System is better for his business and the owner.

### Objections to Quantity Surveys

The objections usually raised by contractors to the general system may be listed as follows: first, every quantity survey made would be distributed indiscriminately and this in turn would mean an increased number of bidders on every project, and second, the adoption of this system will encourage additional men to enter the contractor's field.

I believe that this first fear is unfounded because quantity surveys would accompany plans and specifications as part of the contract documents; and as today, plans and specifications are furnished indiscriminately by some engineers and some owners, so will they be furnished in the future accompanied by a quantity survey; and just as today, some engineers and owners show a fine discrimination in sending out plans and specifications, so will they do so in the future, when these specifications are accompanied by a quantity survey. It would then depend on the engineer and owner, just as it depends on them today, whether there will be few or many bidders on a project. I can even see in the system a force tending to reduce the number of bidders. Some owners include in their list of invited bidders the incompetent contractor or the contractor to whom they would not award a contract under any circumstance, but nevertheless solicit his bid in the hope or expectation that he, through error, will submit a bid much lower than the more competent contractor and then use his bid in a trade with the more competent contractor to have him either meet the low price or at least make some reduction in his price. This error is frequently an error in the incompetent contractor's quantity survey, which by a general system would be eliminated entirely and the spread between the bids accordingly reduced.

The second fear that the system will add more men to the field is, I think, highly debatable. Since the accession to the rank of contractor comes from the ranks of superintendents and foremen or mechanics with training and experience in the construction industry, and not from the legal, medical and other professions, I would ask the contractor if today he were to place in the hands of the superintendent, foreman or mechanic a set of plans and specifications, does that make him a con-

tractor? The contractor answers no, but he says that if you place in his hands a set of plans and specifications accompanied by a quantity survey he at once becomes a contractor, or at least it causes him to reflect and seriously consider entering the contractor's field. If that were true, it would follow that all that prevents one of these men from engaging in business on his own account is his inability to make a proper quantity survey or read a set of plans correctly and I ask, would any contractor retain in his employ any man in these positions who did not thoroughly understand plans and specifications? Another thing, many contractors employ quantity surveyors and if his line of reasoning is correct, they would all enter business.

I believe that the contractor can best accomplish the adoption of the general quantity survey system by giving encouragement and support to the independent quantity surveyor who has established himself or who endeavors to do so, to the end that in time there will be a sufficient number to take care of the requirements of the entire construction industry, at which time it will be a comparatively simple matter to relieve the contractor of all responsibility as to quantity and place it on the owner, where it properly belongs.

The general quantity survey system will surely become an established fact, at some time in the near future. It will come about not by any chance or miracle, but through a natural process of education, following the lines of least resistance, hastened, however, by intelligent guidance which we believe can and should be provided by the American Institute of Quantity Surveyors as an organization, and through the individual member by maintaining and sponsoring only ideals of the loftiest ethical standards in all his relations, which alone will secure for him the esteem and confidence of the owner, the contractor and the engineer. The establishment of the system in the construction industry will and must come about because it is the basis of fair dealing and better business methods in that industry.

ACKNOWLEDGMENT.—From an address delivered at the Second Annual Convention of the American Institute of Quantity Surveyors at Washington, D. C., June 8, 1927.

### Front Cover Illustration

**W**E are indebted to A. Leschen & Sons Rope Co., 5909 Kennerly Avenue, St. Louis, Mo., for the illustration appearing on the front cover of this month's issue of *CONTRACTORS AND ENGINEERS MONTHLY*. It shows the structural steel work on the new \$4,000,000 Civil Courts Building in St. Louis, the foundation of which was

described in our May issue. This is the first unit of that city's \$15,000,000 Memorial Plaza which will cover ten blocks in addition to the space already taken up by municipal buildings. The completed building shown at the left of the photograph is the new Bell Telephone Building, completed about a year ago.

## Outline for a Complete Builders' and Contractors' Local Organization

By G. B. HERINGTON

Secretary, Pacific-Northwest Branch of Associated General Contractors

**T**HIS plan that will be outlined is laid out for a city of 250,000 inhabitants to many times such a population. It presupposes a recognition of the common interest in its sections and in its whole identity.

The first thought behind the comprehensive organization plan is to bind its interest in one common meeting, estimating, and contact site.

No finer plan can be evolved than one which includes a building, housing the offices of general contractors, subcontractors, material and equipment men and the meeting rooms of the organized natural sections. As all of these now pay office rent, or its equivalent, as all have much exchanging of information and use otherwise much time and leg work in so doing, the common roof adds efficient use of time for all concerned and quick and expeditious contact.

This building may well be financed in part by subscription of moneys, further by part stock taking for work done on it and such stock as is so issued should be retireable for cash leaving the common or book valued stock as in the ultimate control of the association itself, this being proposed as a parent association comprised of members of the whole industry. The details of the promotion and financing of such buildings are not remote but can often be best left to some one person specializing in it by agreement.

In such a building, the parent organization owning it may set up a Builders' Club, dining rooms, lounging, meeting, conference and estimating rooms, a post office for exchange of bids on subcontract portions of all jobs and may well look into incorporating a thoroughly equipped quantity surveyor's office for the common benefit. Within the building the general contractor's organizations, the subcontractor's special group organizations and the common organizations of all for handling organized labor can be set up, either as subsidiary groups to the parent organization or otherwise.

In the latter case dues would consist of basic parent association dues, which may carry club

dues or not adding the special dues of each subordinate group, and can be collected thus through one common accounting office and be so disbursed.

In the other case the subordinate associations would remain independent units renting space, paying in only the individual dues of the parent associations members.

There is much to recommend the parent and subordinate organization plan with the single collection system. It can carry on as an unquestioned local authoritative body, can carry on the greater part of the office detail of the various sub-associations and can act as a clearing

house for many matters between the public, the larger groups and the smaller groups. From the standpoint of promoting responsibility in construction practice it can do more than can be done in any other way.

From the standpoint of contact with organized labor, it can represent the whole organized employing industry, can carry on with peace in labor over long terms, can arrange annual adjustments of wages or working conditions and can carry a joint conference and arbitration board with the Building Trades Council or similar body under sound agreements in which this solid front of the organized industry may carry sufficient weight to see carried through.

Likewise accident prevention promotion, apprenticeship administration, gathering of statistical data for the benefit of the industry, insurance in some forms jointly developed for mutual group rates, common checking of quantities, development of proper cash discounts for early payments on invoices, contact with owners and architects as groups, and similar matters can be properly forwarded under the swing of an executive staff which can thus be of the best quality and by rendering so wide a service, be well afforded, in fact no less can be tolerated.

Details such as joint telephone exchange, mail boxes, someone always on hand to receive

*Many organizations exist in the building business of various cities and there is waste, overlapping, rivalry and much loss of energy on the part of those men, found in every city and whose willingness to do betterment association work is used to the utmost, when such waste and overlapping do so occur.*

phone and appointment calls, someone on hand to watch bid dates, some one place to indicate to all concerned bids available or bids wanted, all as in a well run Builders' Exchange, and in addition to contact with all concerned available at any time by a few steps from one office to another, can but develop enormous savings in time, energy and overhead.

The dignity of the construction business so organized, with its own building, its own parking garage below, its club, its dining room, its facilities for developing without lost motion those elements of business synchronism so essential to the conduct of modern building operations, and the fact that it can be well made to pay in savings of time, energy, and business comfort as well as from an investment standpoint, can not but be enhanced and made a matter of civic advancement.

The other side of the picture, the discontent, the frivolous and erratic competition leading to bidding below cost, to failures, the fear of one's competitors, the misery of the industry when unorganized, which allows irresponsible competition to thrive, the preying on the public by such irresponsible competition in fact, another loss of confidence on the part of the building public in the construction industry because it has no responsible, fully representative body behind it, to make it clean itself, is a picture prevalent in altogether too many cities.

To remedy such conditions, to apply a sound, strong, manly and competent business remedy is to demonstrate to the public that builders and contractors do believe in their own field of endeavor as a modern business of dignified place in affairs.

The public works contractor, the contractor doing municipal work, the contractor doing grading only, has a place as one of the strong subdivisions of such a central body and with his own or others of the Associated General Contractors national association, affiliated in such subdivision without loss of identity, may well be housed under this same roof and gain from and add to the strength of such a group. He will bring incentive to equipment dealers to become tenants, he will have part of the publicity promotion of the central body, he will have the protection of and the cohesive organization of such a central body behind him under

proper administration. He buys much of his materials from the same men as do the builders, he has these contacts at his immediate, time saving command and has his own subdivision under his own group's control.

Such a plan in general, properly conceived, its details properly planned and carried out, has two basic elements of success in its genesis; first, the common investment interest and the common contact for business savings, and increasing common ownership as the mortgage equity is reduced; and second, the feeling of strength in high minded common public influence through the bringing to a focus the strength of the business in which one engages as a whole. Each local subdivision also focuses the strong national organization with which affiliated.

It is possible to go on and detail methods of accomplishing this whole plan and of setting up its organization and administration under given local conditions, but I feel the scope of this article to be one of setting out the broad idea. In part it exists in many places, in whole in but few places and is sorely needed in many cities. The more it grows, the more the building and construction industry may respect itself and certainly the more it will gain sound recognition as a powerful part of the business fabric of the cities in which it so establishes itself.

It may be argued that this organization as outlined will be most effective if it is a 100 per cent representative body and its effect be less if not so. To a certain extent this may be conceded as partly desirable, but against this is to be set up an organization of the 50, 65 or 75 per cent of the whole going business as one organizing the best minds, the soundest business firms and the group who will be listened to in council, who set the example and who may soon be in a position to force by example and practice a compliance with sound ethics and decent public relations on the part of those who remain out by their own wish or by the exclusion resulting from dissatisfaction with their known methods of doing business. The strong minded and the right minded will prevail in an incredibly short time under proper administration and organization, but, they will never do so until they get at it.

### Gopher State Has Longest Concrete Road

THE longest continuous stretch of concrete roadway in the world has just been completed between White Bear and Duluth, Minn. This pavement passes through 29 towns and villages over its 137-mile length.

Paving construction on this thoroughfare, State Trunk Highway No. 1, was begun in 1923. High-

way authorities point out that the completed highway will save a great deal of money through low maintenance costs. Maintenance costs for gravel surfacing here have been as much as \$3,000 a mile.

This Minnesota pavement is two miles longer than the concrete pavement extending from Olympia to Vancouver, Wash.



## Bluewater-Toltec Irrigation Project

By VERNON L. SULLIVAN  
Consulting Engineer

**A**T the head of the seven-mile Bluewater Canon in Western New Mexico, where the Bluewater River and Cottonwood Creek join, lies one of the best natural reservoir sites in the Southwest.

More than thirty years ago the United States Government was asked to have the lands within this reservoir site withdrawn for reservoir purposes, and two earth dams have since been constructed, both of which were washed out.

To the north of this reservoir and the proposed irrigated Bluewater valley, lies the snow-capped and majestic Mt. Taylor, while to the south are the beautiful heavily-timbered Zuni mountains. The eastern slope of the latter provides the watershed for this project.

The drainage area is 140 square miles and ranges from 7,000 to over 9,000 feet in ele-

extreme north central part of Valencia County, some 100 miles west of Albuquerque and about 50 miles east of Gallup and lie on both sides of the main line of the Atchison, Topeka & Santa Fé Railroad and the Old Trails National Highway. The lands are of a silty, sandy loam and are fertile, well located at an elevation of approximately 6,500 feet above sea level.

The soils are adapted to a wide range of crops and the climatic conditions permit of the successful growing of alfalfa, oats, wheat, barley, rye, fruits, celery, onions, beans, etc.

The owners of the lands to be irrigated will own all of the water, water rights, dams, reservoirs and canals.

The plans and specifications for the irrigation system as adopted by the District were designed by the writer and approved by J. P. Lippincott Co., of Los Angeles. Anderson



**CONSTRUCTION PLANT AT THE BLUEWATER DAM**

This plant consists of a Ransome  $\frac{3}{4}$ -yard mixer, a Ransome steel tower, 180 feet high and 350 feet of steel chute, including a Ransome counterweight chute. The chuting layout was designed by the J. W. Bartholow Co., Dallas, Texas. Concrete was poured with this plant at the rate of 500 yards in a 24-hour shift

vation. The yearly run-off varies from 1547 acre-feet in 1922 to 49,547 acre-feet in 1915, and would therefore require a storage of 50,000 acre-feet in order to provide carry-over of flood waters one year to another.

The Bluewater-Toltec Irrigation District was organized under the laws of the State of New Mexico, by Reid, Hervey & Iden, attorneys at Albuquerque. A \$350,000.00 bond issue was made to finance the construction of the irrigation works. The Chancellor-Canfield Midway Oil Co. purchased \$135,000.00 of the bonds and the contractors purchased the balance, all at par.

The lands to be irrigated and which go to make up the District consist of some 10,000 acres of level, irrigable lands located in the

Brothers, contractors, of El Paso, Texas, had the contract for the construction work. F. Y. Wadlington was construction superintendent.

The main part of the irrigation works is the construction of the main storage dam at the head of the Bluewater Cañon, where the natural and flood waters are to be stored and released back into the canon as needed for irrigation below, where they are again diverted from the stream at several points by low concrete diversion dams into various canals that convey the water to the lands to be irrigated. Thus the return waters from the irrigation of the upper lands is available and will be diverted on to the lands lower down.

The main storage dam is a single reinforced concrete arch across the cañon, with a 148-foot



gravity end on the lower south side, in which are located two large syphonic spillways. The maximum height of the dam is 43 feet and the length of the arch is approximately 389 feet on a 175-foot radius. Two 30-inch cast iron high pressure gates provide duplicate outlets.

The reservoir capacity is approximately 53,000 acre-feet.

On the opposite side of the cañon from the gravity section of the dam the walls rise some 150 feet above the top of the dam, and upon this bluff are located the construction power plant, crusher, rollers, bins, mixers, etc., and the concrete aggregate for the dam foundation was shot to place from there through some 500 feet of steel chutes. For the top portion of the dam the concrete is shot to a tower and there raised and again shot to place.

The concrete mix forming the aggregate for the foundation was per batch as follows: 3 sacks cement; 2.25 cubic feet rock screenings; 12.75 cubic feet washed creek sand, and 12.75 cubic feet of crushed limestone rock, mixed with 28 gallons of water. Rubble rock not in excess of 25 per cent was permitted to be placed in the concrete as it was poured. This aggregate made a very dense and strong concrete and works very well. Later, when the water in the reservoir began to raise, creek sand was cut off and crushed rock sand is now being used. This made a harsh aggregate and would not shoot well, so the mix was changed and the slump increased. The mix as now being used

per batch is:  $3\frac{3}{4}$  sacks cement; 14 cubic feet crushed rock sand and 13 cubic feet of crushed rock limestone, mixed with 34 gallons of water.

Southwestern Portland Cement is used and all cement and concrete samples are being tested by El Paso Testing laboratories. Concrete aggregate test cylinders are regularly made and tested on 7 and 28 days, one cylinder being kept for future crushing. Some samples, where a question might arise, were taken from the dam and tested.

Maximum and minimum temperatures were taken during the winter of both the weather and the internal concrete. The minimum weather temperature dropped to 26 degrees below zero on the 24th day of December. During the coldest weather the concrete was protected by canvas and heated with salamanders and steam pipes. Only one pour of concrete was frozen a little around the edges and this was all removed before the next pour.

The structure is of a rather bold design when considering the length of the arch. However, the top is crowned with wide and deep coping that is carefully reinforced to care for any buckling action and all precaution is taken in securing a safe and permanent structure.

The construction of this irrigation project will develop an oasis in the desert, and the 7-mile reservoir lake nestled in the pine-covered mountains will afford a resting place for the tourist and a joyful camping and fishing place locally, that can only be appreciated through actual participation.

### Typical National Safety Council Posters



FULL COOPERATION BETWEEN EMPLOYER AND EMPLOYEE IS NECESSARY FOR REAL SAFETY



A SAD SITUATION WHICH CAN BE AVOIDED BY THINKING AND ACTING SAFELY

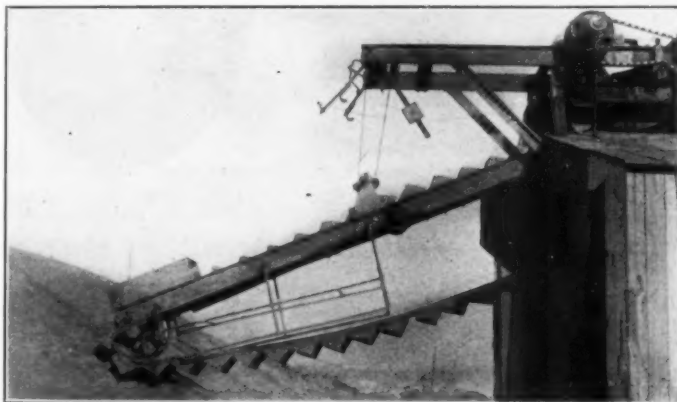
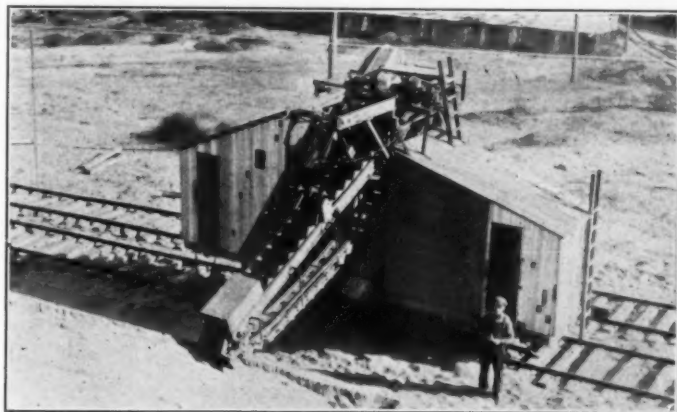
## Novel Method of Obtaining Sand from Dunes

*Inexhaustible Supply of Sand, Shifted in by the Winds, is Reclaimed by Bucket Conveyor*

A VERY novel method is employed by the Market Street Railway Co. in San Francisco in obtaining sand used in concrete construction and for other uses. This sand is obtained from sand dunes about 1½ miles from the Ocean beach by means of a portable electrically operated elevator, cur-

sand elevator which moves back and forth on steel rails, which extend between the spur track and the sand pile. This sand pile is about 400 feet in length and 20 feet high. An endless bucket conveyor extends out from the side of the sand elevator. This bucket conveyor is adjustable, being hinged to the ele-

SAND  
CONVEYOR  
MOUNTED  
ON  
TROLLEY  
TRUCK



CLOSE UP  
OF CONVEYOR  
FOR  
HANDLING  
SAND

rent for operating the motors being obtained by means of an extension line which is connected to a trolley wire. An inexhaustible supply of good, clean sand is constantly being shifted in from the ocean beach by the winds.

A spur track has been built to the sand pile which permits cars to be run alongside the

vator, and can be raised and lowered by means of a cable wound on a drum which is driven by an electric motor. Two men can load 80 cubic yards of sand in sixty minutes.

This sand elevator was built in the shops of the Market Street Railway Co., San Francisco, Calif.

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*A contractor is no stronger than his organization. A sound superstructure on a weak foundation is a potential failure. The contractor who recognizes his working force as his foundation and builds it soundly is building for success.—The Highway Magazine*

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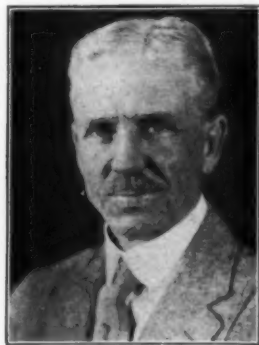
## Well Known Distributors of Construction Equipment



W. A. Kuhlman, W. A. Kuhlman & Co., Toledo, Ohio



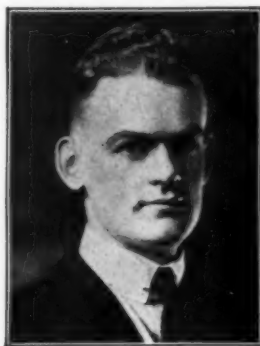
J. L. Latture, Pres. & Mgr., J. L. Latture Equip. Co., Portland, Ore.



Wm. H. Hale, Wm. H. Hale Co., Minneapolis, Minn.



Arthur Prausnitz, Pres., Engineering Products Co., Peoples Gas Bldg., Chicago, Ill.



Herbert Gad, Herbert Gad Co., Birmingham, Ala.



A. L. Crow, Pres., Alabama Equip. Co., Birmingham, Ala.



Frank B. Phinney, 148-152 Fairmount Ave., Hyde Park, Boston, Mass.



C. A. Wilson, Vice Pres. & Gen. Mgr., Perry & Wilson Equip. Co., Inc., Indianapolis, Ind.



Albert J. Hahn, Service Equip. Co., Philadelphia, Pa.



Ole K. Olsen, 508 Millanden St.,  
New Orleans, La.



C. H. Brinker, Pres., Brinker  
Supply Co., Pittsburgh, Pa.



L. D. Llewellyn, L. D. Llewellyn,  
Inc., Miami, Fla.



George E. Hoppe, Richmond,  
Va.



H. L. McDonald, McDonald &  
Burgman, Jacksonville, Fla.



O. H. Miller, Gen. Mgr., Choc-  
taw Culvert & Machy. Co.,  
Memphis, Tenn.

## Officers of the Rogers Bros. Corporation, Albion, Pa.



Charles A. Rogers, President



Hugh L. Rogers, Secretary



Louis J. Rogers, Vice-President

## Current Business Conditions

*Analyzing Current Data from the Standpoint of the Contractor*

Edited by GEORGE E. MacILWAIN, Business Economist

### Election Year Need Not Be Bad

There is a general idea that business slumps in the year of Presidential elections. I referred to this in last month's issue. Herewith I am able to present this admirable chart, which covers actual experience with election years for fifty years back. In but two of these years—1908 and 1916—was there improvement in business. The 1916 record owes itself to the war. In all of the others there was a drop in business activity. In all cases except 1920 this drop was followed by improvement. The decline of 1920 may be set down to the credit of post-war deflation.

The levels reached by improvement following the drop were lower than the previous levels in six cases. In six cases the improvement level was higher than the previous level. In one case the resulting level was practically the same as existed before the drop.

The conclusion from this survey is that nothing decided can be drawn from our experience of elections in more than fifty years. Six occasions show poorer business. Six occasions show better business. One year holds level.

The upshot of it all is that we get out of elections about what we expect! What we expect depends on a number of things. But it seems certain that there is no hard and fast rule that business goes to the dogs every time we elect

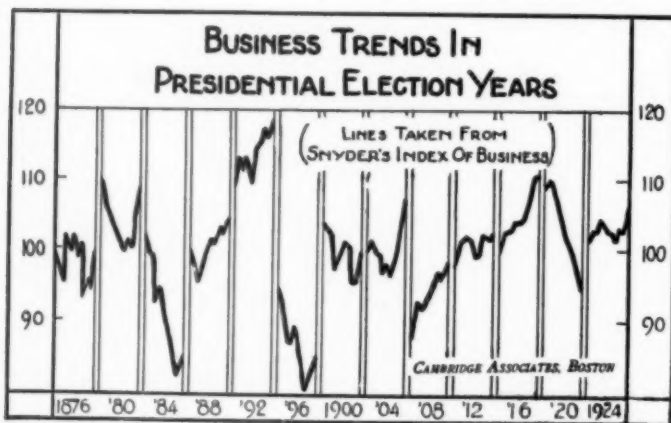
a President. It is, at most, an even toss.

At the present time there is an element of conservatism about business that gives hope that conservative candidates will be put up. At the same time, there is a general satisfaction with business conditions among most classes that makes it unlikely that protest movements will gather any particular momentum. Until something distinctly different from what is now in sight politically develops, we may expect no serious upset to business as a result of the 1928 election. And in my judgment the *expectation* has a good deal to do with the *result*.

### Crop Improvement Will Help Farmers

We are far enough along now to feel pretty sure that the farmers are, in the main, to be very much better off than they were last year. The favorable weather through September has helped the corn farmers amazingly—almost beyond expectation—and the condition of cotton bids fair to result in a larger crop than the forecast of September set forth. Still, cotton prices will be much higher than they were last year and the cotton states will feel the benefit.

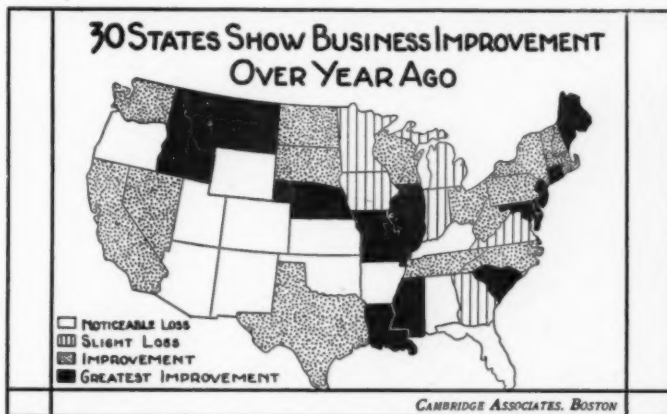
It is natural to expect that public works will be carried on extensively in the states where the farmers have good crops. The outstanding territories outside of the cotton states where this is true are: Nebraska, Minnesota, the



**FIFTY  
YEAR'S OF  
PRESIDENTIAL  
ELECTIONS  
DISMISSES  
BOGEY**



BUSINESS  
MAP WILL SHOW  
MORE  
BLACK  
AS  
WE GO  
INTO THE  
FALL



Dakotas, Montana, Washington, Oregon, California, Kansas and Michigan. Illinois, Indiana, Idaho and Ohio will be better than was expected a month ago, on account of improvement in corn. So, too, will Iowa.

Of the New England States, Connecticut has the best immediate prospects, though all of the New England States are looking for good business this fall.

The great eastern states, where business activity bulks large, give promise of a good degree of activity, though there will not be the improvement over last year that will be noticed in the farm states. But these eastern states will benefit indirectly; increased buying of the farmers stimulates manufacturing activity.

#### How Long Will Prosperity Last?

Roger W. Babson, in his annual address on the Business Outlook, stated that the present levels of business would be maintained for two or three years more. Coming from this source, which is not inclined to be too hopeful about the future, this opinion should give courage to business men and to the readers of this magazine, whose business depends so directly on general business conditions.

#### Federal Reserve System Has Right Idea

The tendency in some quarters, particularly in the West, to decry the Federal Reserve Banking System, is unfortunate and mistaken. Undoubtedly the aim of the Federal Reserve is to stimulate movements of money abroad—and without question this is right. Too much money here means high prices and inflation of business. Export of money to foreign lands, under wise restrictions, means reduction of our own supply of money to more reasonable

limits and the avoidance of high prices and inflation at home and it means the development of foreign business and our best customers are the ones, abroad, that are taking the largest amounts of our money.

United States prosperity cannot be maintained by creating an *island of prosperity* in the United States, while the rest of the world languishes. Our prosperity depends upon world prosperity. The whole question has its difficulties, to be sure, and we are only at the beginning. But it should be recognized that the "International" attitude of the Federal Reserve System, which is the point of attack in the Central West, is the true attitude for the United States to take.

#### Higher Prices for Building Material Ahead

The continued activity in building means firmer prices for material in the months ahead. If there is to be a drop in prices, beyond the usual mid-winter seasonal drop, it will develop on the basis of 1928 demands as they materialize. Such a drop may come, but there is nothing in sight at present to make it safe to predict it. This particularly applies to public works activity. It is my opinion that declines in material prices will come from a lowering of activity in residence and office building. The materials used in small residences are not the ones used in public works. The erection of steel and concrete buildings is the line of activity that uses materials common to the contracting business and it is the future of this line of general building that contractors should watch. What is to be done in 1928 in this line of building will become apparent as we go into mid-winter and spring. There are no data available at present for estimating it.

## Demolition for Constructive Purposes



**PROGRESS OF STREET WIDENING IN ST. LOUIS, MO., SHOWING OLIVE STREET WIDENED FROM TWELFTH BOULEVARD TO CHANNING AVENUE, A DISTANCE OF TWENTY-TWO BLOCKS**  
Forty feet were sliced from the buildings on the south side of the street. Photograph courtesy of St. Louis News Service



**BUILDING DEMOLITION IN NEW YORK ALONG THE LINE OF THE NEW EIGHTH AVENUE SUBWAY EXTENSION**

This program is made possible through the cooperation of the Board of Transportation in its subway construction and the Borough of Manhattan which will later widen the roadway to take advantage of this opportunity to furnish a wider north and south thoroughfare

## Legal Points for Contractors

*These brief abstracts of court decisions in the contracting fields may aid you in avoiding legal difficulties. Local ordinances or state laws may alter the conditions in your community. If in doubt, consult your own lawyer*

Edited by A. L. H. Street, Attorney-at-Law

### Material Man Holds Surety on Contractor's Bond

One can hardly avoid sympathizing with the surety on a contractor's bond when he becomes the "goat." But, of course, every surety is bound to foresee when he signs a bond that he is a potential Billy. The idea is that the beneficiaries of a bond are entitled to the hold that the beard and horns of a goat afford, rather than resort to a greased-pig hold upon the principal obligor.

Nevertheless, even a billy-goat can put up a fight before he is subjected, and sometimes it takes a lot of litigation to convince a contractor's surety. For example, in the case of Graphic Arts Building Co. vs. Union Indemnity Co., 111 Southern Reporter, 470, decided by the Louisiana Supreme Court November 2, 1926, a building contractor's corporate surety could not see why it should pay for materials that were not used on the job, being disposed of by the contractor elsewhere. But the court ruled that it was not necessary that the material man "follow up the shipment of materials furnished to see that all of such materials actually went into the building being constructed."

"The question might be different," adds the opinion, "if this were a contest between the owner and the furnisher of the materials, with the latter claiming a privilege [lien] on the building."

### Contractor's Bond Did Not Limit Time for Suing On It

Ever since Portia thwarted Shylock by insisting upon a technical interpretation of Antonio's bond, it has been the vogue for sureties to try to get out of their obligations through kindred interpretations. Sometimes equity and justice have supported the defense; very frequently it has been found that no valid excuse for dodging payment was presented.

In the case of Reynolds vs. Bonner, 110 Southern Reporter, 756, decided November 29, 1926, by the Louisiana Supreme Court, it appeared that a road had been built for the city of New Orleans. The contractors gave the city a bond to secure against defects arising within one year from October 29, 1917, the date of completion and acceptance of the work.

When sued on the bond, after expiration of the year but for defects arising within that period, the surety company contended that the suit was barred by a proviso in the bond to the effect that the bond should terminate one year after October 29, 1917. Holding that the defense was unsound, the court said:

"This proviso is a mere . . . repetition of the preceding clause in the bond as to the liability of the surety company for the maintenance of the road for one year from its completion and acceptance by the city, . . . the plain intent and purpose of the proviso being to limit the period of the suretyship or guaranty as to the upkeep of the road to twelve months, and no more, after its completion and acceptance."

### Contractor Must Watch His Smoke

One of the risks involved in operating steam hoisting apparatus, etc., on a job near frame buildings is indicated in the decision handed down January 3, 1927, by the Louisiana Supreme Court in the case of Prescott vs. Central Contracting Co., 111 Southern Reporter, 269.

Sparks from such equipment set fire to a building in Shreveport and the court upheld judgment against the contractor for the resulting damage. Negligence was found to exist in failure to use a proper spark arrester and in the use of refuse pine material. The court remarked:

"Those who employ agencies which might endanger persons or property, must use care commensurate with the danger and risk reasonably to be apprehended. . . .

"Defendants had knowledge that plaintiffs' building was an old, frame structure, covered with an easily ignited shingle roof; that their hoisting engine was being operated in close proximity to that building and that their smokestack was approximately as high and near to that roof. They also knew that sparks from their smokestack had set fire to the roof of plaintiffs' building on an occasion previous to the fire which gave rise to this suit, and there is nothing . . . to indicate that they made any attempt, after the first fire, to correct the condition which caused that fire or to guard against the probability of its recurrence."

### Contract Gave City Too Much Leeway

It may be that, as remarked by Bulwer Lytton in "Richelieu," the "bright lexicon of youth" contains "no such word as 'fail,'" but a decision of the Maryland Court of Appeals shows that there can be such word in a contract for public work, and, moreover, that it can have considerable kick to it.

In the Maryland case (Christilf vs. Mayor and City Council of City of Baltimore, 136 Atlantic Reporter, 527), decided January 26, 1927, plaintiffs highway contractors, were defeated in an attempt

to collect damages resulting from delay on the part of the city in acquiring the necessary right of way.

The contract expressly provided that the contractors should be entitled to an extension of time for completing their work, but no damages, in case of the "failure or inability" of the city to secure the right of way in due time. Holding that the clause protected the city even against its own negligence in delaying acquisition of the right of way, the court observed:

"The term 'failure or inability' is used in its most general sense without limitation or restriction, and so includes a 'failure or inability' arising from any cause, save, of course, fraud, corruption, or bad faith, and hence embraces a 'failure or inability' ascribable to inaction, lack of diligence, or reasonable effort."

### Liability of Societies to Building Contractors

It is as interesting as it may appear to be strange that church corporations are often as prone to controvert a contractor's right to pay for labor and material in doing work for them as any other class of owners. Sometimes the report of a court decision inspires the thought that before commencing the erection of a church, the parson should have delivered a sermon to the building committee on a text to be found in Jeremiah, XXII, 13:

"Woe unto him that buildeth his house by unrighteousness and his chambers by wrong; that useth his neighbor's service without wages, and giveth him not for his work."

In the case of *Mood vs. Methodist Episcopal Church South*, 289 South Western Reporter, 460, decided by the Court of Civil Appeals of Texas October 22, 1926, it was held that a building contractor was entitled to extra pay for work done in compliance with changes made by the architect in plans to remedy defects in the original specifications.

Incidentally, it was decided that all members of an unincorporated association who participate in creating a debt on its part, or who assent to incurring it, are personally liable to the creditor.

### The "Public's" Interest in High Wages

Can you imagine the static that would disturb the ear if some Legislature should pass a law making it unlawful for a public board to award a contract without securing to the successful contractor a profit equal to that derived in the same locality from similar work done for private individuals?

Yet, why do people react differently to such a law as that in New York, requiring that men em-

ployed on public works shall be paid the rate of wages prevailing in the locality?

The Office Boy suggests that it may be because more workmen than contractors go to the polls and elect the members of the Legislature. But you must not pay any attention to him.

The real reason for the existence of the New York law, and kindred laws in other states, is immaterial. That point is lost in the proposition that it is law, and law is law, whether it puts its protecting arm around all the people or a group.

In the case of *Campbell vs. City of New York*, 155 North Eastern Reporter, 628, decided February 23, 1927, the New York Court of Appeals notes that "The public policy of the state declared by successive Legislatures during a period of 30 years . . . exacts the payment of the rate of wages prevailing in the vicinage to laborers and mechanics employed upon the public works."

It is held by the court that contractors cannot complain because the law prevents workmen from bargaining with them on mutually satisfactory terms, nor can taxpayers object because the law tends to increase the cost of public work.

### Blasting Contractors' Liability to Nearby Property Owners

That the sovereign power might scatter rocks around on private premises in the construction of public works is not a privilege that inures to the benefit of a public contractor, according to the view taken of the law by the United States Circuit Court of Appeals, Fourth Circuit, in the case of *Asheville Construction Co. vs. Southern Railway Co.*, 19 Federal Reporter, Second Series, 32, decided April 20, 1927. The court said:

"Where one, in the carrying on of blasting operations, throws rock or debris on the property of another, he is liable for the damage done, on the principle that he is guilty of trespass, and quite irrespective of the question of his negligence. . . . And, as the referee has found that under the circumstances of the case the blasting operations were intrinsically dangerous, it is equally well settled that the contractor is liable for the damage caused by the subcontractor. . . ."

"Defendants contend, however, that they were constructing the highway under contract with the road district, that the district was an agency of the state for the construction of roads, and as such not liable in an action for damages, and that, as they were engaged in the work for which the district was created, they enjoy the same immunity from suits for damages which it enjoys; . . . but, irrespective of the liability of the district, we think that there can be no doubt that the contractor and subcontractor are liable for the damages caused."

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*Have you any special legal problem facing you? If you wish a series of abstracts of similar cases write to Contractors and Engineers Monthly*

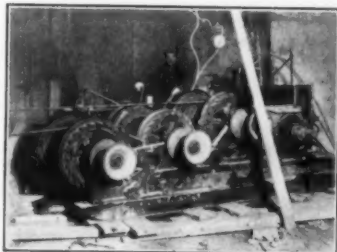
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## Electric Hoist Acts as Modern Hod Carrier

*Operator Controls High Speed Elevator from the Ground*

**T**HE hoisting elevator is perhaps the hardest worked of all equipment in the construction of tall buildings. As the stone masons follow on the heels of the steel erectors, this elevator keeps them supplied with stone and mortar. Just a step behind are the glaziers adding the windows, and later on, when the interior finishers are at work, this same elevator carries material to them.

In erecting Eaton Tower, a thirty-four story office building just being completed in Detroit, Mich., The Otto Misch Co. has installed a 100-horsepower Dinkey controller, manufactured by The Electric Controller & Manufacturing Co., Cleveland, Ohio, for controlling the hoist motor of the construction elevators. By means of a sys-



**THE ELECTRIC HOIST**



**EATON TOWER, DETROIT, MICH.,  
NEARING COMPLETION**

tem of levers connected to the handle of the controller, which is mounted at one end of the hoist, control is brought within reach of the operator's other levers.

Unlike the usual freight elevator, the operator does not ride the platform but controls it through a hoist on the ground floor. Markers on the cable indicate to him the position of the elevator and, by watching these, he brings the platform to the floor level. Quite often, when a heavy load is to be moved, a man at the floor must assist the operator by bell signals to bring the elevator exactly on a line with the floor. For this purpose the hoist control must permit very accurate hoisting. A safety feature employed by the builders of this Tower prevents a bell signal being given to the hoist operator as long as any gate on the elevator shaft is not tightly closed. Small contactors hold the bell circuit open when a gate is open.

These controllers are being used at the addition to the Fort Shelby Hotel, and Barlum Towers in Detroit, which are also being built by The Otto Misch Co.

## Management and Methods in Concrete Highway Construction

**J. L. HARRISON**, Highway Engineer, U. S. Bureau of Public Roads, well known for his invaluable contributions to highway construction literature, through *Public Roads*, the monthly publication of the U. S. Bureau of Public Roads, his articles in technical magazines and his papers presented before conventions, has prepared this very helpful 242-page book for contractors. In its sixteen chapters, the following topics are adequately discussed: Planning the Conduct of the Work, Production Management, Purchasing Aggregate for Yield, Preparing the Subgrade, Fine Grading and Form Setting, Handling the Aggregate and the Cement, the Proper Truck Supply, Hauling to the Mixer by Truck, Field Stock Piling, the Use of Industrial Railway in Hauling to the Mixer, Final Fine Grading, the Operation of the Mixer, Water in Mixing and Curing, Finish-

ing and Curing, the Origin and Cost of Overruns, Organization and Equipment.

This book will be of particular interest to the contractor because the construction of a concrete pavement is a manufacturing process in which labor and machinery are used to handle, treat and place in final position those materials which are the necessary ingredients of the pavement. The contractors problem is to obtain a profit from this work. This book admirably shows him the proper methods of managing the job. It is also of interest to designing engineers, giving them a more complete knowledge of the elements which affect cost that they may give these questions a broader consideration when design and specifications are under consideration. Construction engineers and inspectors will also find this book replete with data helpful to them. The price of the book is \$3.00.



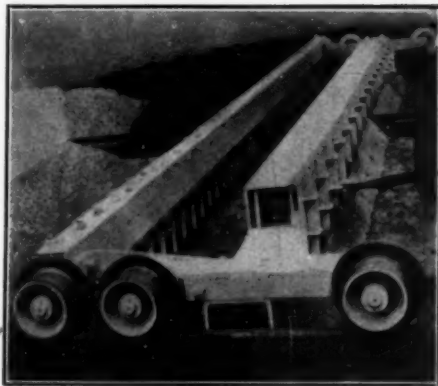
## A New Subgrade Tester

*Unit Has Test Template on Separate Wheel*

A NEW subgrade tester, specified by most states and commonly called a scratch template by contractors, with a clean-up blade in front of it, is being put on the market by Ted Carr & Co., 939 W. North Avenue, Chicago, Ill. A special feature of the new unit is that the test template is on a separate wheel so that the vertical movements of the trail grader will not lift it off the forms. Either one can be furnished separately.

The trail grader is made primarily to be pulled by a paving mixer, and make the final scraping and cleaning up of the subgrade, or carry a pile of sand in front of it to automatically fill up the low places in the subgrade, or spread concrete where a smooth top is not desired, such as a subbase for asphalt pavement. However, it can be furnished with crank axle and wheels at its center to enable it to be raised and turned or rolled out of the way for use on jobs with central mixing plants or for building subgrades in sand, cinders, or loose material. It can likewise be used for spreading a sand course, and for paving bricks or blocks.

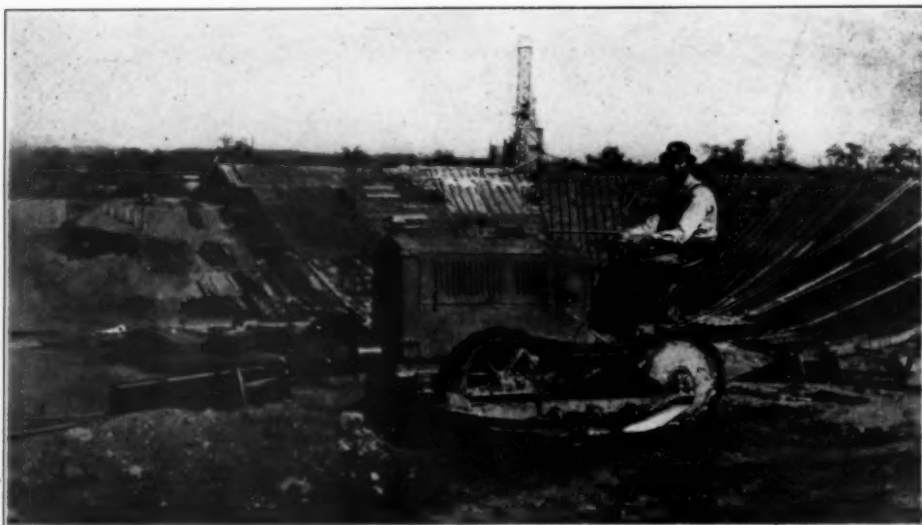
The blades are sharp on both edges and reversible, and are adapted to be used either with or without a center joint or side rod reinforcing. The end trucks hold the beam at any desired height, and the blades across the road to any desired profile at any desired depth below the top of the forms. The beam is made of a rectangular box section giving great stiffness and having no open channels to fill up with concrete. The beam



THE NEW CARR SUBGRADE TESTER WITH CLEAN-UP BLADE

is adjustable to widths of road from 14 to 24 feet.

The machine was designed by Ted Carr who was the inventor and pioneer on subgrade scrapers for preparing the subgrade by running on the forms, and is the owner of the pioneer subgrade scraper patent under which the subgrade machines manufactured by Edward R. Bacon of San Francisco, Lakewood Engineering Co. of Cleveland, and the Hug Co. of Highland, Ill., are licensed.



A CLETRAC WHICH PLAYED A PROMINENT PART IN THE GRADING OPERATIONS OF THE NEW STADIUM OF THE UNIVERSITY OF MICHIGAN, AT ANN ARBOR, MICH. THE STADIUM IS SEEN IN THE BACKGROUND

## A Machine That Puts the Cracks Where They Belong

*Creates Planes of Weakness in Concrete Roads Doing Away with Unsightly Meandering Cracks*

**T**HE weakened plane type of concrete highway construction, consisting of constructing a longitudinal groove in the center of the road to control longitudinal breaks, and similar transverse grooves for controlling contraction or transverse breaks, is becoming more and more popular with engineers. A machine that produces both longitudinal and transverse grooves mechanically is being manufactured by the Flexible Road Joint

is so designed that it will construct the joint on the center of superelevated widened curves up to and including 24 feet in width.

The operation of the machine is simple. Traveling on the side forms, it follows directly back of the finishing machine or hand screeds, being propelled by hand power. A spading tool which opens up a preliminary groove for the center plate is attached in front and on the center of the machine.



GENERAL VIEW OF THE FLEXIBLE ROAD JOINT MACHINE READY TO INSERT THE CENTER PLATE



THE CENTER LINE JOINT BEFORE FILLING WITH ASPHALT OR OTHER COMPOSITION



REMOVING THE CENTER PLATE AND EDGING THE JOINT



POURING THE JOINT WITH A HELTZEL MACHINE

Machine Co., Warren, Ohio. This machine has been giving excellent results for the past four years in several of the leading concrete road states—among which are Ohio, Pennsylvania, Delaware, Missouri and Michigan.

Approximately five miles of road south of Battle Creek, Mich., are now being completed by Whitlow & Hobeck of South Haven, Mich., using this system, and on which the accompanying illustrations were taken.

The machine is adjustable from 16 to 24 feet and

This shoves the coarse aggregate to one side, allowing the placing of the center plate more readily.

After the machine has progressed ten feet, the V-shape center plate is placed on a mandrel and pressed into the prepared groove by two compression screws on the machine.

When the plate has been placed, the mandrel is raised and swung out of line and the next operation consists of placing the expanding bar in the center plate, care being taken to see that the expanding bar laps back into the preceding center

plate to assure perfect alignment. After the expanding bar has been placed, the surface is floated by small hand floats and the machine goes forward ten feet, opening up the groove for the next plate. A mechanical finishing belt is attached to the rear of the machine for the final belting.

As soon as the concrete has taken its initial set, the center plate is removed and the groove is edged with a double edger. This operation is done from a traveling bridge. The slab is then burlapped.

When earth, straw or similar methods are used for curing, the pouring of the joint is most generally done before the curing is placed. However, some contractors prefer to wait until the completion

of the work before pouring, the only difference being that it is necessary to clean out the joint. This is sometimes done by using a small air compressor similar to those used at filling stations, it being mounted on a truck and the cleaning and pouring done at the same time. A simple method when air is used is to attach a sharp steel point to the end of the hose, forcing this along the groove and blowing out the dirt at the same time.

Pouring of the joint has been greatly simplified by the development of a special pouring machine made by The Heltzel Steel Form & Iron Co., Warren, Ohio.

## Hydrometer Determines Moisture in Aggregate

*Small Easily Used Piece of Equipment a Real Aid to Better Concrete*

**A** FEW pounds of common salt dissolved in water to form a saturated solution and the new Dravo hydrometer made by the Dravo Equipment Co., Penn Avenue and Barbeau Street, Pittsburgh, Pa., are all that are necessary to determine the moisture content of aggregates. The reading of the hydrometer after the test gives the

number of gallons of water in each cubic foot of aggregate.

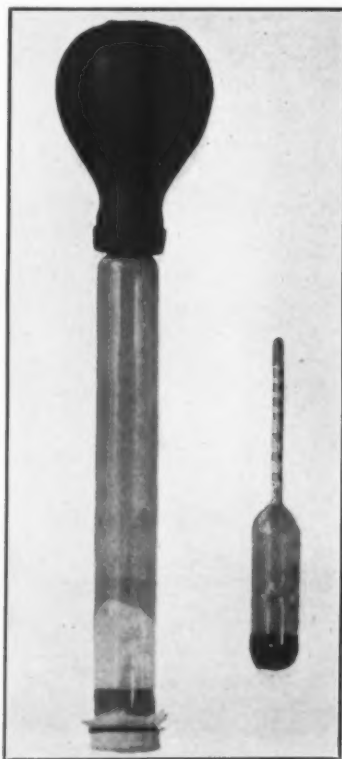
In preparing to use the hydrometer, three pounds of common salt are dissolved in a gallon of water which gives a sufficient solution to perform eight tests. Care must be taken that the solution is saturated and reads zero on the hydrometer. Sometimes it is necessary to stir or to heat the water to secure the saturated solution.

If it takes too much time to secure a saturated solution of common salt, calcium chloride can be used instead of the salt. This is often necessary where hard water must be used to dissolve the salt. The calcium chloride solution must be adjusted either by adding water and stirring or by adding calcium chloride and stirring until solution gives a zero reading when tested with the hydrometer. This is necessary as calcium chloride has the property of absorbing water from the atmosphere.

In using the hydrometer, equal volumes of either of the solutions and the aggregate to be tested, sand, gravel, stone or other material are mixed together and stirred thoroughly. The size of the sample of aggregate will naturally depend on the nature of the aggregate. A one-pint sample is sufficient for sand or pea gravel up to about two quarts for the largest aggregate. The resulting liquids, which include the moisture which was mixed with the aggregate, is sampled with the hydrometer and a reading secured from the float in gallons of water per cubic foot of aggregate.

If a reading of gallons of water per 100 pounds of aggregate is desired,  $26\frac{3}{4}$  ounces of the aggregate should be weighed out and mixed with exactly one pint of the prepared saturated solution. If this sample is too small, the quantities of both the sample and the solution can be doubled.

The discoloration of the resulting liquid is of no consequence, because it is due solely to suspended matter and does not affect the specific gravity of the liquid. No correction for absorbed moisture is necessary. The hydrometer and syringe should be kept clean and the solution should be checked carefully for a zero reading each time before running a test.



**NEW DRAVO HYDROMETER FOR MAKING MOISTURE DETERMINATIONS**

## A New Reversible Gasoline Hoist

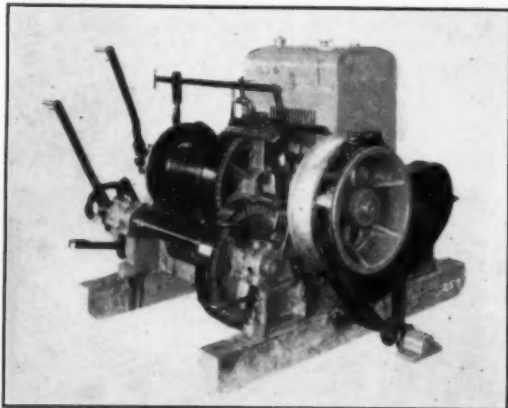
*Strong, Dependable Design for Heavy Elevator Work*

**A**N announcement of interest to building contractors is the placing on the market of a new reversible hoist for double cage elevator work by the Mundy Sales Corp., 30 Church Street, New York, N. Y.

This hoist is driven through a Link-Belt silent chain drive running in an oil tight chain case. The same standard gasoline engines as used on the Mundy single- and three-speed hoists furnish the power. The LeRoi gasoline engine is used on the 8-, 12- and 15-horsepower sizes, the Continental on the 20-horsepower and the Waukesha on sizes above 20 horsepower.

The elevator sheave is fitted with a brake band and clutch lever, and is controlled from the operator's side of the hoist. The reversing drive gears are on the inside of the hoist frame instead of on the outside. This makes a much stronger design of hoist for this work.

The drum on this hoist is also reversible, and when the reverse lever is in neutral the drum can be operated as a standard friction drum type.



THE NEW MUNDY REVERSIBLE GASOLINE HOIST

## A New Unit of Paint Spray Equipment

*8-Foot Extension and Paint Gun Make Light Weight, Well Balanced Outfit*

**A**NEW development in paint spray equipment has been brought out by The Alexander Milburn Co., Baltimore, Md., by a combination of an extension and paint gun. It has been designed particularly for painting ceilings, high walls, ship sides, tanks, freight cars, gondolas and other high surfaces without the use of so many ladders or scaffolding, permitting a great saving in time and reduction in costs.

The unit consists of an 8-foot extension and the standard Milburn type E gun; pressure-feed tank with regulators, etc., mounted on the tank head; 25 feet of air hose; 25 feet of paint hose and 25 feet of air hose with connections to connect from the compressor to pressure container. The extension and gun only can be purchased, if desired, for use with any pressure-feed unit already in use.

The extension itself is ruggedly constructed of strong tubing and has the gun and angle controls close to the bottom for easy manipulation of the spray. It is light in weight, well balanced and easily handled and, coupled with the operator's reach, projects the painting operation to an ap-

proximate height of 14 feet. It grips the standard Milburn gun, which, while in use, can be swiveled to any desired angle. Any length of extension can be furnished upon specification. For painting within arm's length the gun is immediately detachable and can be used as a hand spray.

The operation of this new unit is very simple. A slight pull on the operating handle of the extension operates both the air and paint valves on the spray gun simultaneously. The paint, under pressure, flows to the atomizing chamber, is expanded and driven with ample force into the pores of the surface to be covered. Daubing and brush marks are eliminated. The atomization is so fine and even that "orange-peel" is reduced, minimizing sanding and rubbing.

According to the manufacturers, one man with the extension spray can do five times more work than by hand brushing and at a much lower cost. While painting a ship at a Navy Yard recently, this spray covered 9,000 square feet of surface, spraying a heavy anti-fouling paint weighing 17 pounds to the gallon, which the manufacturers believe is a new record.

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*The element of increased safety to the public enters into accident prevention in the construction industry as dangers to "innocent bystanders" in the vicinity of construction operations can be removed by careful safety planning on every job at all times.*

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## New Concrete Surfacing Tool

*Quickly and Easily Smooths Concrete and Saves Much Time and Labor*

OF considerable interest to contractors who are confronted with the problem of giving suitable finish to concrete surfaces is the announcement by the Ingersoll-Rand Co., 11 Broadway, New York, N. Y., of a new portable concrete surfacing machine, operated by compressed air. This machine quickly and easily smooths concrete surfaces and removes form marks. It saves

on edge and cutting into the work, a flexible joint is provided in the wheel head. This flexible coupling is a special feature of the tool and insures the true action of the wheel on the surface being finished. The wheels are easily renewed when worn down by use.

A 3-cylinder type of air motor is used in the machine and is of a balanced type smooth running



**SURFACING  
A RETAINING WALL  
WITH  
INGERSOLL-RAND  
PNEUMATIC  
SURFACING  
EQUIPMENT**

much time and labor on this work and gives a far better job than hand rubbing. It will surface either green or old concrete.

The machine is equipped with a ring-shaped grinding wheel which utilizes the flat face of the wheel, the grinding wheel being held in a wheel head by one side with the other side open for grinding. To keep the grinding wheel from tipping

and free from breakdowns. All wearing parts, including the cylinders, are renewable, and the cost of upkeep is thus reduced to a minimum. The tool weighs only 13 pounds and is easily handled in any position.

When provided with special grinding wheels the tool, known as Size 6G, may be used for finishing and polishing monumental and building stone.

### \$280,000 Worth of Highway for \$1.00

MASSACHUSETTS is to have a new section of State Highway 8,371 feet in length built of bituminous macadam and reinforced concrete for the amazingly low sum of \$1.00. This project includes the laying out of the highway over a new location in the vicinity of Wayside Inn in Sudbury, Mass., which was purchased by Henry Ford two years ago and reopened as a museum and inn for the traveler. This highway work is aimed to correct a dangerous situation and to remove heavy truck traffic to some distance from the Inn.

The contractor is Henry Ford and the contract, signed late in August in Boston, is as formal as that for any kind of State work and ample surety was given to assure its completion. The right of

way is to be 100 feet in width and there will be a central way 10 feet wide of bituminous macadam with a cement concrete way 10 feet wide on each side of it. With a 3-foot shoulder of macadam and a 7-foot grass plot on each outer side, the total width of the roadway itself will be 50 feet.

### Contractor Fined on Own Road

ADMIRING the smooth-riding qualities of his own workmanship, Louis Perini of Framingham, Mass., the contractor who built the new highway in Brookfield, couldn't resist the temptation to "step on it," as he drove over the highway. But State Patrolman Robert Jones is no respecter of persons, and Perini was fined \$15 by Judge Butterworth in the district court.



## A Self-Propelled Portable Stone Crusher

*A Time and Money Saver That May Be Put Into Operation by a Single Shift of the Clutch*

A SELF-PROPELLED steel jaw portable stone crusher, fully equipped with folding elevator and movable bins or chute screens, has been produced by the Acme Road Machinery Co., Inc., Frankfort, N. Y. This is a time and money saving unit that may be moved under its own power direct to any stone supply along the

to divert the motor power of this unit from the driving wheels to the steel frame jaw crusher. Haulage costs are greatly reduced and the sturdy crushing jaws may be put into instant operation. The folding elevator can be erected by one man in three minutes.

Using a No. 6 size elevator, with Fordson engine



ACME SELF-PROPELLED CRUSHER WITH TRAILER BIN, FOLDING ELEVATOR AND CHUTE SCREEN

road and then put into instant and immediate operation by a single shift of the clutch. It is both operated and propelled by one Fordson or McCormick-Deering tractor power plant.

The usual highway problem of getting the crusher to the stone source, or crushing as and when the stone is needed on the job, is solved by the ease with which a single clutch may be shifted

at a speed of 325 to 350 r.p.m. and a 6 x 10-inch receiving opening, 3 to 5 tons of stone per hour can be crushed with jaws at 2 inches. Using a No. 9¾ size elevator, with 15-30 McCormick-Deering engine at a speed of 300 to 325 r.p.m. and a 12- x 20-inch receiving opening, 20 to 25 tons of stone per hour can be crushed with jaws at 2 inches. All units are mounted on special I-beams.

## Notes of News

### Strauss Engineering Corporation

THE Strauss Bascul Bridge Co., 307 North Michigan Avenue, Chicago, Ill., has announced that it has changed its corporate title to Strauss Engineering Corporation and that the business of the corporation will be conducted under that name in the future. The officers of the corporation are Joseph B. Strauss, President; Charles A. Ellis and Clifford E. Paine, Vice-Presidents. The corporation will specialize, as heretofore, in all types of movable, fixed and long-span bridges and toll bridge projects.

### Trackson Appoints New Distributors

THE Trackson Co., 500 Clinton Street, Milwaukee, Wis., has announced the appointment of two new distributors for Trackson Full-Crawlers. The appointments are the William Ford Co., 15841 Second Boulevard, Highland Park, Mich., for the Detroit territory and the T. W. Meiklejohn Co., Fond du Lac, Wis., for the Milwaukee territory. These companies will carry both the standard model F Trackson Full-Crawler and the heavy-duty model D Trackson as well as repair parts for both models.

## A New Conveyor for Trencher

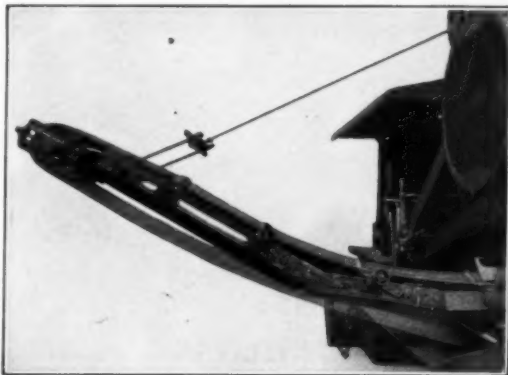
*It Can Be Shifted Instantly from One Side to the Other or to Any Intermediate Point*

**A** NEW conveyor that is constructed to meet all conditions arising in the field, is now being offered by the Harnischfeger Corp., Milwaukee, Wis., builders of gas-driven excavators. This part of the P & H trencher can be shifted instantly by power from one side to the other or to any intermediate point.

This conveyor is convertible from the cradle type to a hinged and cable supported type by simply pulling one pin. This gives the advantage of raising or lowering the discharging end in case of loading trucks or when necessary to handle extra spoil to cave-ins or extra depth or width. This is also desirable when moving the machines from job to job as the conveyor can be instantly raised by power for travel clearance. It is not necessary to take out a number of bolts; merely remove one lock pin.

The outside frame members have been eliminated in the conveyor and in their place a center frame or backbone construction is used. This eliminates the possibility of dirt hitting the frame and landing on the lower side of the belt, causing wear and slippage.

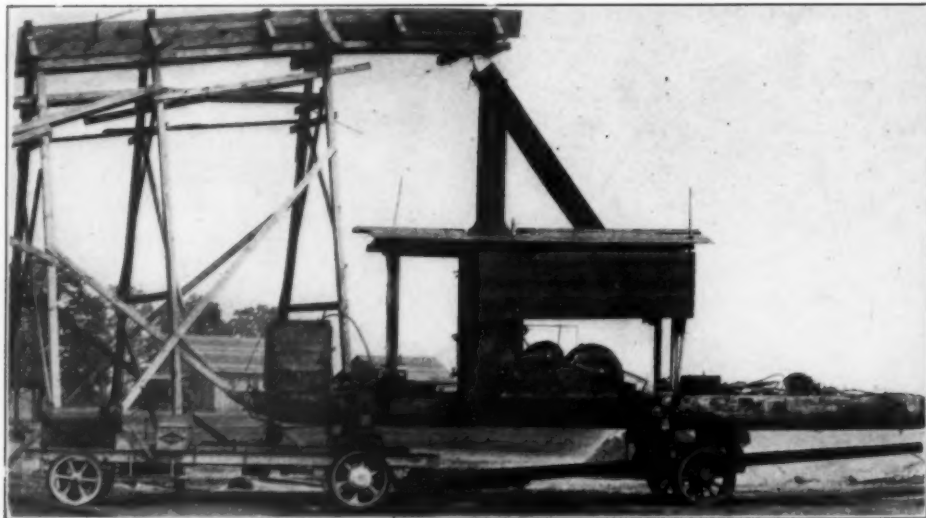
The old conical belt rollers have also been



**NEW CONVEYOR FOR P. & H. TRENCHERS**

eliminated and straight ones used instead. This construction forms a better trough and does away with dirt guides which take up considerable carrying space of the belt and by rubbing continuously on the belt wear off the rubber facing, shortening the life of the belt and creating an unnecessary belt expense.

## Ingenuity—The Contractors' Sixth Sense



**A CLEVER RIGGING BY WHICH A WHITE TRUCK WAS ABLE TO HANDLE A 21-TON LOAD**

## Dredging Engines for Heavy Continuous Service

*Possibility of Shut-downs Overcome in Work of Varying Loads*

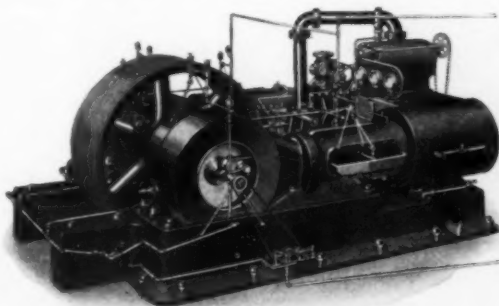
**D**ESIGNED for heavy continuous service for driving centrifugal dredge pumps where greatly varying loads, due to the difference in the consistency of the material to be pumped are encountered, a high grade machine built of the best materials obtainable is being manufactured by the Murray Iron Works Co., Burlington, Iowa.

The engine shown in the illustration is a 14-inch and 25-inch x 18-inch cross-compound balanced slide valve designed to develop 300 indicated horsepower at the most economical load when operating with 150 pounds initial steam pressure at the throttle. It has a 24- to 26-inch vacuum, and operates as 225 r.p.m.

It is built upon the Murray rolling mill type frame, having large bearings with both horizontal and vertical adjustment and maximum size crank and cross-head pins and cross-head shoes. The pins have hardened and ground bearings.

The slide valves are balanced, the high pressure being single ported and the low pressure double ported, and a by-pass is provided with reducing and safety valves for by-passing live steam to the low pressure cylinder.

The engine speed is controlled by a flat spring shaft governor which acts upon the travel of the high pressure valve. An adjustment is provided at the rocker arm for varying the low pressure



**A MURRAY DREDGING ENGINE**

valve travel and the receiver pressure. The wheel is 6 feet in diameter, grooved for fifteen 1¼-inch ropes, for rope driving a centrifugal pump. The engine is equipped with a continuous gravity type oiling system with oil filter, pressure tank and pumps.

The unit is self-contained as it is mounted upon a deep box section cast-iron base and is very compact, requiring little floor space for the power developed; the over-all dimensions are 15 feet 8 inches long, 10 feet 2 inches wide and 8 feet 6 inches high.

## A New Electric Melting Pot

*This Small Size Product Has a Capacity of 27 to 40 Pounds*

**A** NEW electric melting pot, with a capacity of from 27 to 40 pounds, according to the metal to be melted, has been developed by



**THE NEW G. E. ELECTRIC MELTING POT**

the General Electric Co., Schenectady, N. Y., for melting solder, lead, babbitt, tin, etc. The pot may be operated on either 110- or 220-volt AC or DC circuits and is made in two ratings, 750 and 1,000 watts.

This pot is the smallest size of the General Electric RP form E line. It consists of a durable sheet steel cylindrical casing 10 inches deep and 9 inches in diameter, in which is supported a cast iron crucible 4 inches deep and 6 inches in diameter, inside. The space between the crucible is efficiently insulated with a compact heat insulator.

Heating units are of the cast-in, sheath-wire type so successfully applied to metal melting. One unit is used in each pot, dissipating 750 watts in one rating, and 1,000 watts in the other. The leads of the unit are brought over the top of the pot into a connection box fixed to the unit itself.

This new pot is designed for melting lead, babbitt, tin, solder and similar alloys or metals, except spelter or zinc, at temperatures not exceeding 950 degrees Fahrenheit. Capacities are as follows: for 50/50 solder, 30 pounds; for lead, 40 pounds; for babbitt, 37 pounds, and for tin, 27 pounds.

The pot is sturdy and compact and aptly suited to fulfil the requirements of a small size unit.

## A New Brick Unloader That Reduces Costs

*Equipped with Wire Belt Running on Ball Bearing Rollers that are Mounted on a Spring Suspended Box*

A NEW brick unloader has been developed by the George Haiss Manufacturing Co., Inc., 142nd Street and Park Avenue, New York. Comparing this conveyor with the hand method of unloading brick, the manufacturers state that it is 100 per cent faster, the waiting time of the truck is reduced 50 per cent and the saving in cost of unloading is exactly one-half what it costs to unload by hand labor. Thus, by making quicker deliveries, the saving will pay for the machine in

right angles to the parallel direction for moving on and off the boat, according to the position desired.

These wheels are connected to the axle by means of auto-truck type knuckle axles and from the axle is supported to the conveyor by 2½-inch extra heavy pipe. This pipe is so arranged that one is stationary and the other is pivoted and by means of a winch the conveyor can be raised or lowered.



THE  
NEW HAISS  
BRICK UNLOADER  
DELIVERING  
BRICKS  
FROM A  
SCOW  
TO A MOTOR  
TRUCK

three to six months, depending on the quantity of material handled.

The new machine consists of a conveyor frame 40 feet long mounted on swivel wheels that are placed on a dock; the lower section, or opposite end, is mounted on a 2-wheel truck which has a fifth-wheel swinging arrangement and a pole extension that allows the laborers to move it and steer it in the desired direction. The wheels that are mounted on the dock each can be swiveled to run parallel with the water, or can be turned at

The main feature of the new machine is that it is equipped with a wire belt 20 inches wide running on ball bearing rollers, which rollers are mounted on a spring suspended box which allows the rollers to release and not take the jar of the bricks when they are thrown on the belt by the laborers.

The head and tail pulley are large in diameter, lagged with oak, and the whole is driven by means of a diamond 1½-inch pitch roller chain, by an electric motor or gasoline engine.

### Standardization of Replaceable Cutting Edges for Grader Blades

THE Division of Simplified Practice of the Department of Commerce is attempting the standardization of replaceable cutting edges for grading machines, road maintainers, steel drags, etc., as has been suggested by the Missouri State Highway Department to the U. S. Bureau of Public Roads.

The Missouri Department believes that this standardization would mean a great saving in labor and time, and prove a great convenience if any 8-inch edge would fit any 8-inch mold board, and any 10-inch edge a 10-inch board, etc. This would also mean a considerable saving to the manufacturers, and the Federal Department believes this simplification can be accomplished through the cooperation of the State Highway Departments as consumers, and the equipment manufacturers.

### Origin of "Horsepower"

THE horsepower unit is said to have been established in a curious way by James Watt, the story being that Watt gathered copious figures to find out the average which the horses of his district could perform. He found that the raising of 22,000 pounds, one foot per minute, was about an actual horsepower. At this time Watt was employed in the manufacture of engines. Customers were so hard to find that all kinds of artificial encouragements were considered necessary to induce power users to buy steam engines. As a method of encouraging business, Watt offered to sell engines reckoning 33,000 foot pounds to a horsepower, or one-half more than the actual. And thus what was intended as a temporary expedient to promote business was the means of giving a false unit of very important measurement to the world.—*Russell News.*

## New Concrete Highway Surfacers

*One-man Operation, Easy Transportation and No Adjustment Are Features*

**A** MACHINE for effectively and economically removing high spots in concrete roads, usually found at expansion joints and in connection with repair work, has been developed and placed on the market by The Concrete Surfacing Machinery Co., Cincinnati, Ohio.

This new machine requires only one man for its operation and, according to the manufacturers, will do the work of approximately ten men working by hand methods and will do it 100 per cent better, since the surface treated can be made perfectly smooth.

The unit consists of an air cooled gas engine mounted on a chassis, connected by means of a flexible coupling to a cutter head operated through the medium of bevel gears, all of which (shaft and gears) are carried on Timken roller bearings. Hardened gears are used which run in oil, requiring very little attention. The chassis is mounted on two wheels with a third swivel disappearing caster on the front end which, by means of the foot can be placed in operation so that the outfit can be hauled from place to place by means of the swivel caster and truck wheels. When it is desired to put the machine in operation the operator throws the swivel handle forward so that the cutter head will come in contact with the surface to be removed.

The cutter head is easily removable for the replacement of worn out cutters and, as two cutter



**THE NEW BERG SURFACER FOR CONCRETE ROADS**

heads are supplied with each machine, one is always ready for operation while the worn cutters in the cutter head are being replaced.

The machine weighs 250 pounds. It is easily operated and transported from one job to another, and requires practically no adjustment for continuous and satisfactory service.

## Crawler Tractor Used in Difficult Conditions

*Large Quantities of Crushed Stone Spread in One Trip on Driveway to New Race Track*



**TRACKSON FULL-CRAWLER-EQUIPPED FORDSON WITH STANDARD HIGH LIFT NORTH DIGGER OWNED BY THE LEX CONSTRUCTION COMPANY**

**O**F considerable interest to contractors who are confronted with much the same problems as the Lex Construction Co., West Allis, Wis., is this equipment which has given very satisfactory results in making a driveway from the main road to a new whippet race track about 10 miles from Milwaukee.

A Fordson equipped with Trackson full-crawlers of the Trackson Co., 500 Clinton Street, Milwaukee, Wis., and a standard high-lift North digger is doing as much work in a day as 10 men or more can do with shovels, according to Lyman Tremelling who drives the tractor. Using the digger bucket as a spreader, it is possible to spread as much of the crushed stone in one trip across the width of the drive as it would take a man an hour to shovel. This outfit spreads the stone as fast as eight big Mack trucks bring it in, each hauling about 5 tons per trip.

The Lex Construction Co. owns three of these crawler tractors; one equipped with a Wehr grader and the other two with North diggers. The latter are used especially for sidewalk excavating and grading, and for snatching big trucks out of the mud and deep sand where they become mired.



## New Machine to Replace Hand-Hoeing of Plaster

*It Will Turn Out a Thoroughly Mixed 4-Hod Batch of Mortar or Plaster in Two Minutes*

A NEW 1-bag mortar and plaster mixer with several unique features of speed, portability and durability is announced as an addition to the line of concrete making machinery of the Marsh-Capron Co., Chicago, Ill. According to tests, this machine, to be known as "The Mechanical Hoeman," will handle easily the requirements of from 12 to 14 plasterers or 50 brick layers. In some instances a single operator with this machine has been able to handle the mixing and to carry plaster for a crew of five fast plasterers without any additional help.

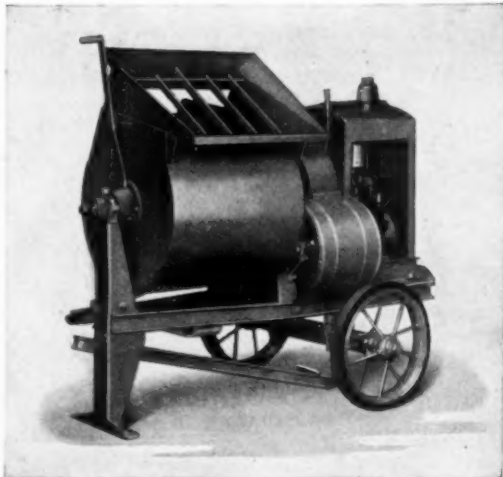
As a result of a special design of the mixing hopper and blades and a 24 r.p.m. speed, an even workable mixture of a 4-hod batch of any kind of mortar or plaster can be turned out in two minutes' time.

Two styles of mounting are provided. On the two wheeled trailer mounting, equipped with a telescoping steel hauling hitch, careful attention has been paid to balancing so that it can easily be handled behind a truck or in confined quarters, the wheels being equipped with solid rubber tires, cushion springs and roller bearings. For inside work when speedy portability is not a factor a steel caster mounting is provided. Since this permits the mixer to pass easily through narrow halls, or a 36-inch door, the mixer may be moved from room to room as the job progresses. This style is also equipped with the telescopic hauling hitch.

One of the most interesting features is the mounting of the mixing drum. The drum is supported on self-aligning trunnions, carried in bearings on the main frame. These trunnions are bored and form the bearings for the hoe shaft, which is thus relieved of all loads or strains except the mixing action and cannot be cramped or twisted due to misalignment or twisting strains in the main frame. The hoe shaft is center drilled for lubrication by compression grease cups on the ends of the shaft. The hoe shaft turns at 24 r.p.m.

Each mixing hoe is formed of three steel bars, especially shaped to give rapid and thorough mixing action. The mixing hoes with their end scrapers are set at a close fit to the barrel and ends of the drum, to thoroughly scrape and clean the drum at every revolution.

A discharge spout built as part of the drum con-



THE MARSH-CAPRON MECHANICAL HOEMAN

fines the batch to a narrow stream, permitting discharge into wheelbarrows. A specially designed combination hopper and grill allows fast, safe charging. The hopper will receive a wheelbarrow load at a time. All the sand, plaster and water easily pass through the bars of the grid which guards the revolving hoes of the mixer.

A foot lever releases the drum, which is tilted to discharge the mix. The drum is locked to tilt in discharge direction only while mixing, but may be unlocked instantly to permit tilting in reverse direction for washing out.

The engine to clutch counter-shaft drive is by sprocket and chain. The counter-shaft is carried in self-aligning bearings. All thrust loads due to clutch engagement are taken on ball thrust-bearings, with hardened steel ball races, enclosed in steel dirt-proof cases. Thorough lubrication to the shaft and thrust bearings is provided by compression grease cups. The clutch and all gears, sprockets and drive chain are enclosed in steel guards.

A completely enclosed gasoline engine is provided as standard power equipment but electric motor drive is optional if desired.

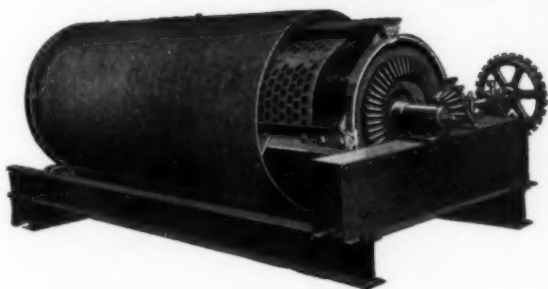
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*Statistics prove that the cost to the contractor for every accident on his work is at least five times more than the loss to the insurance company. Take your last job and multiply by five the amount of money paid out by your insurance company for medical attention and compensation—that is the minimum loss you sustained out of your profit which could have been saved by intelligent accident prevention.—Lone Star Constructor*

---

*built on the  
ball mill  
principle  
this*

# New scrubber washes out the clay balls



**M**OST of the trouble in washing gravel is caused by clay. The ordinary washer, whether cylindrical or conical, rolls this sticky clay into balls. Sand and particles of rock are picked up, giving the clay balls an armor-like coating which makes them even more difficult to break down.

**A New and Better Scrubbing Device.** The Tel Smith-Ajax Washer employs a new washing agency—the grinding action of the big rock. The scrubber is divided into several compartments by retainer rings which pass the small rock but re-

tard the progress of the large aggregate. The sand, which tends to blanket this grinding action, is rapidly flushed out through perforations in the scrubber. Operating on the ball mill principle, the large rocks pound and grind the troublesome clay balls to a paste, which is easily and quickly washed out.

**Two-section sand jacket—all metal construction—these are also new and important features of the Ajax Washer.** You'll want all the details, of course. Bulletin A. W. 21 gladly mailed without cost or obligation.

## SMITH ENGINEERING WORKS

1820 Holton Street, Milwaukee, Wis.

Canadian Representative—Canadian Ingersoll-Rand Co., Montreal, P. Q. A.W.I.  
 11 West 42nd St. Old Colony Bldg., 80 Federal St. Beckwith Mchy. Co. Tower Mchy. Co. Milburn Mchy. Co.  
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# TELSMITH-AJAX

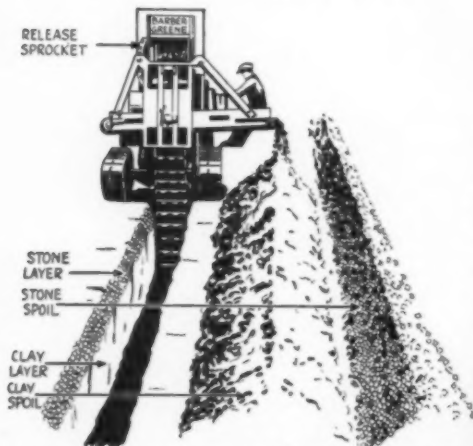
Yes—we would like you to mention the CONTRACTORS AND ENGINEERS MONTHLY.

## Unique Application of Ditcher in San Antonio

*Gas Company Uses It to Separate Stone as Well as Dig Ditches*

THE San Antonio Gas Co. of San Antonio, Texas, recently discovered a new and practical method of making one machine perform two operations. This was by using a Barber-Greene ditcher for digging as well as for separating broken stone from ordinary soil.

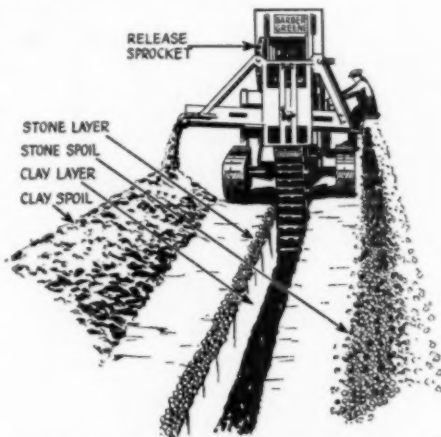
The machine had been sent out to excavate a ditch 19 inches wide and 4 feet deep. Preliminary to doing this, however, it was the intention of the foreman to remove about 6 inches of broken stone from the surface of the street by hand. This is necessary in San Antonio, due to the high demand for broken stone. The job of removing the stone proved to be very slow work and required constant use of the picks. The ditching machine was new and since the gas company was anxious to put it through various tests to determine for just what amount of work they could depend on it, the fore-



EXCAVATION WITH THE STONE AND CLAY SPOIL ON SAME SIDE OF TRENCH

man decided to try removing the stone as well as the ordinary soil with the ditcher. He also decided to try to separate the two materials with this machine.

Digging was started at one end of the block with the boom lowered only 8 inches. This meant that only the broken stone was being excavated. The spoil conveyor was adjusted so that the broken stone would be deposited fairly near the edge of the excavation. When that block was finished, the machine was turned around, putting the discharge end of the spoil conveyor on the opposite side of the ditch. The boom was then lowered to 4 feet and the second cut was made, bringing up this time only the finer material. In this way the material was dug and separated in two operations. The work was done fast and efficiently. In taking off the top 8 inches of broken stone, the ditcher made a speed of 5 feet per minute, and in taking off the



EXCAVATION SHOWING STONE AND CLAY SPOIL ON OPPOSITE SIDES OF THE TRENCH

deeper cut of 4 feet, the machine made a speed of 3 feet per minute.

Later in the day it was found that the separating could take place and still have both kinds of material on the same side of the ditch. The first cut was made removing the topping, and this was thrown about 4 feet from the center line of the ditch. Then, when the second cut was made, bringing up the finer material, which was rather like clay, the spoil conveyor on the machine was adjusted so that this finer material would be de-



THE BARBER-GREENE DITCHER IN ACTION



### Pick up your 'phone

**WHEN** a rush job comes you want action. Barrett is organized to give it:

—With a greater number of distributing points for road building materials than any other manufacturer.

—With unequalled facilities (plants, organization and equipment) which insure prompt delivery from these distributing points.

As a result, you get Tarvia how you want it, where you want it—and when you want it.

**Tarvia**  
For Road Construction  
Repair and Maintenance

New York  
St. Louis  
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The *Barrett* Company

In Canada:

THE BARRETT COMPANY, Limited, Montreal, Toronto, Winnipeg, Vancouver

Cleveland  
Toledo  
Buffalo

Philadelphia  
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Boston  
Kansas City  
Lebanon  
Columbus  
Rochester

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posited next to the bank of the ditch, making two rows of spoil on the same side of the ditch and yet separated far enough to take away the stone, which was on the outside.

Part of the sub-soil in San Antonio is a sand rock formation, which was very nice work for the machine, and some of it was very hard clay. In other places, the machine struck a formation similar to caliche. This is naturally cemented gravel,

the largest stone being about 8 inches in diameter. The ditcher would break a great many of these before pulling them out. The stone itself was very hard, a great deal of it being flint rock. Had it not been for the overload release sprocket on the ditcher, which absorbed such shocks as striking through very hard material, the foreman would have never dared to put the machine in the ground where there was any such formation as this.

## Notes of News

### New Snare Corporation Officials

**A**T the recent election of officers of the Frederick Snare Corporation, contracting engineers, 114 Liberty Street, New York, Frederick Snare, Senior, who since the original organization of the company has been President, was elected Chairman of the Board of Directors. In this new position, Mr. Snare will continue to supervise the business of the company. Arthur W. Buttenheim, formerly Senior Vice-president, was elected President. Three vice-presidents were elected, Edward S. Skillin, who was formerly Second Vice-president, being made Senior Vice-president; George P. Seeley, Jr., the present Havana Manager of the company, was elected Vice-president; and Randall Cremer, General Manager of the company with headquarters in New York, was made a Vice-president. Frederick Snare, Jr., was re-elected Secretary and Treasurer. F. J. Litter, continues as Chief Engineer of the company.

It is interesting to note that all the officers referred to above have been connected with the corporation for many years, Messrs. Snare, Buttenheim and Skillin for 27 years; Mr. Seeley for 18 years; Mr. Cremer for 14 years; Mr. Litter, 26 years; and Mr. Snare, Jr., 16 years.

The Frederick Snare Corporation was originally organized in 1900, at the time being known as Snare & Triest, Inc. During the 27 years of its existence this company has operated extensively in the United States, Cuba, West Indies and South America and has successfully completed a wide variety of contract work including difficult substructure and superstructure contracts. In recent years the company has made a specialty of difficult engineering contracts. Among the more recent completed may be mentioned the foundations for the Tottenville and Howland Hook approaches of the Interstate bridges now being built by the Port of New York Authority. They were also the general contractors for the entire substructure and superstructure work on the one-million-horsepower Hudson Avenue generating station of the Brooklyn Edison Co. From a very small start in 1900 the net worth of the company has increased so that it now has a capital and surplus in excess of two million dollars.

### Shearer Leaves Industrial Works

**A**NNOUNCEMENT has been made of the resignation, effective October 20th, of Charles E. Shearer, for several years Advertising Manager for the Industrial Works, Bay City, Mich.

### Blaw-Knox New York City Office

**T**HE Blaw-Knox Co., Pittsburgh, Pa., has announced that its New York office is now located in the Canadian Pacific Building, 342 Madison Avenue, New York.

### SAFETY FIRST



"HEY! GET THA HELL OUT FROM UNDER THERE  
—WHERE WOULD YA BE IF THIS THING SHOULD  
FALL?"

Wash drawing by Paul D. Webb, printed through the courtesy of Life. Copyright Life Publishing Co.



# Ransome

## Announces

### No. 5-S Standard Building Mixer

### "A One Bagger"

(1-2½-4) for—

The smaller contractors who want a one-bagger built to the standards of large mixers.

The large contractors who are not satisfied with a small mixer built to lower standards.



**DRUM**—42 inches by 30 inches, with unusually large rounded corner to facilitate quick mixing with easy cleaning and give ample room to handle a one-bag batch of 1-2½-4.

**QUICK FEED**—The charging chute is large and shaped to give rapid charging with wheelbarrows. Power loader takes full load without crowding and goes up in five seconds.

**FAST DISCHARGE**—Six to seven seconds.

**CONTROL**—All control levers at drum end. Operator sees both power loader and discharge.

**GEARS**—Cut for quiet running. Alemite lubrication.

**FRAME**—Simple and rugged with unusual accessibility for making repairs or replacements.

**TRUCKS**—Short-coupled with front wheels turning under frame—easy to get mixer into limited space.

**CHOICE OF POWER**—Single cylinder LeRox or Novo; two cylinder Novo or electric motor.

## Ransome Concrete Machinery Company

1850 — Service for 77 Years — 1927

Dunellen

New Jersey

When writing to advertisers please mention the CONTRACTORS AND ENGINEERS MONTHLY—Thank You



A PARADE OF THE EQUIPMENT USED IN THE CONSTRUCTION OF THE SOUTHERN PACIFIC CO.'S THREE MILLION BARREL OIL RESERVOIR

## Construction of the Largest Oil Storage Reservoir Ever Built by a Railroad Company

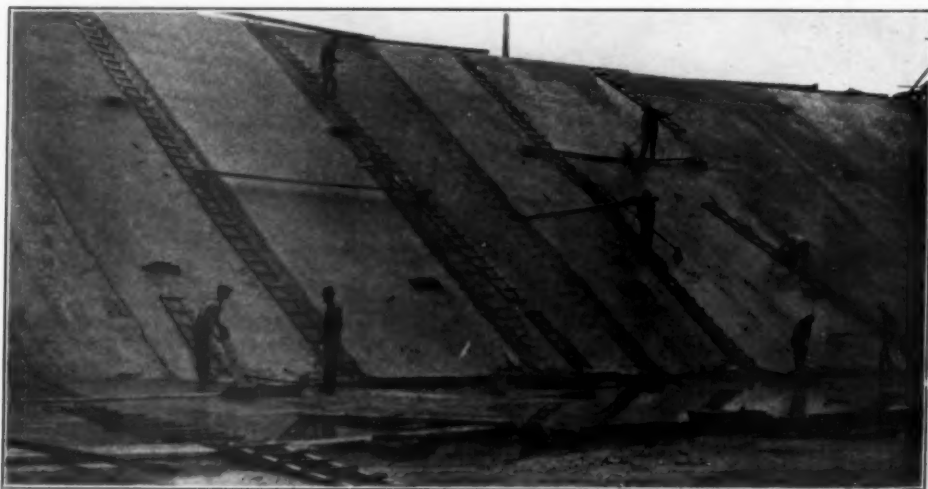
*\$75,000.00 Worth of Equipment Used*

**T**HE largest oil storage reservoir ever built by a railroad company, and one of the largest oil containers in the world, was completed by Bent Bros. of Los Angeles for the Southern Pacific Co. at Tracy, Calif.

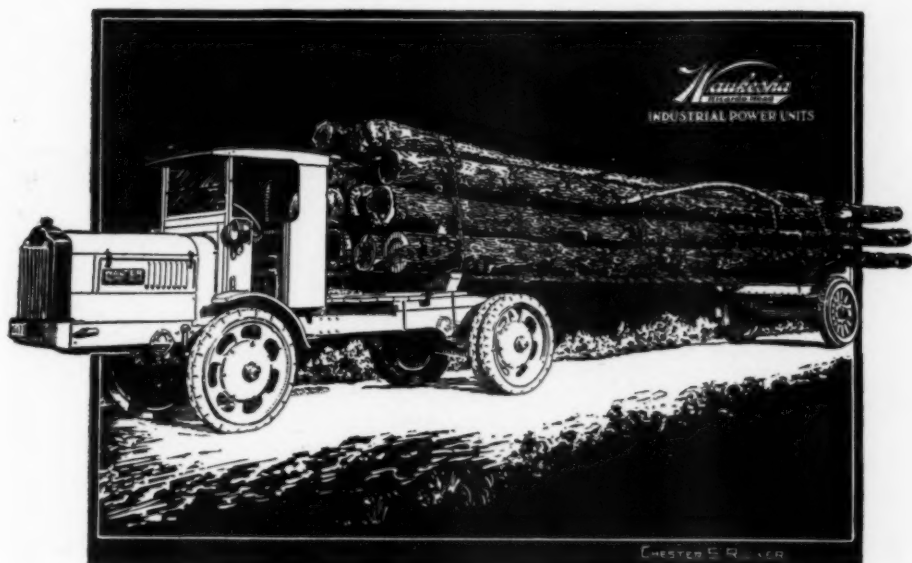
Approximately \$75,000.00 worth of equipment was used by the contractors, which included 5 Caterpillar tractors, 2 Western elevating graders, 45 Western wheel scrapers, 5 Western plows, 25 Watson dump wagons, 10 petrolithic roller tampers built by Killifer Manufacturing Co., 1 locomotive crane, a gasoline dragline excavator, 2 concrete mixers and hoists, 6 Ford dump trucks, and various miscellaneous equipment such as water pumps, pipe lines, several hundred feet of hose, blacksmith shop, power saws, and various hand tools for earth work, concreting and carpentry. Some 300 men and 400 head of stock were engaged on the grading work, with complete camp, cook house and corral facilities at the site.

Caterpillar tractors were used in operating the elevating graders, the Killifer petrolithic tampers, and other equipment. The general superintendent of Bent Bros. stated that he considers these tampers the only tool that will compact earth to a point where it will not settle. Of course the knowledge of just how wet to make the earth and how fast to travel with the roller as well as various other kinks must be considered to get a good job. It was found on this job that it takes one roller for about every 300 cubic yards placed in the fill to get a good job.

The construction operation was carried forward as rapidly as possible, the contractor's forces working both day and night. For night work the area was illuminated with powerful electric flood lights. Work was started on the building of camp in a hard rain storm which lasted for about one week and regardless of the handicap in the start the contractor was through and moved away 91 days



METHOD OF CONCRETING WALLS OF OIL STORAGE RESERVOIR

*Waukesha Engined Walter Four-Wheel Drive Lumber Tractor*

n-726-m

## Summer and Winter

Power—lots of it and reliable—is necessary to bring these big four-wheel drive tractors, carrying 12 to 15-ton loads, through the snow and muddy roads in the year round service to which they are put. Heavy duty six-cylinder engines of the same design as the big 100 H.P. four-cylinder power shovel engines now so well known are used. Such service proves the correctness of the principles on which all Waukesha "Ricardo Head" engines are built and the character of workmanship put in them.

*Within a year after the first of these Walter Truck Tractors was introduced into one Pennsylvania logging district, twenty-eight more were sold. Reliable Power is essential to their success. Efficiently applied to all four wheels, as in this case, explains the phenomenal success of these tractors. No matter what equipment you buy—if it has a Waukesha Engine, you know that it is reliable because in each case the companies who value their reputation highly have selected Waukesha heavy duty engines.*

N-776-L

INDUSTRIAL EQUIPMENT DIVISION

## WAUKESHA MOTOR COMPANY

Waukesha

Wisconsin

New York  
8 W. 40th St.Kansas City  
V. L. Phillips Co.Denver  
Wilson Macky, Co.Tulsa  
C. F. Camp Co.Houston  
Portable Rotary Rig Co.San Francisco  
C. A. Watts

*Exclusive Builders of Heavy Duty Gasoline Engines for Over Twenty Years*

Yes—we would like you to mention the CONTRACTORS AND ENGINEERS MONTHLY.

from the date of signing the contract, which was a few days prior to the start of building camp.

The following quantities were handled on this job:

215,000 cubic yards of excavation,  
140,000 cubic yards of embankment,  
8,300 cubic yards of reinforced concrete in 4 inch lining.

1,550,000 feet of lumber in roof, and  
6,133 squares of roofing.

The reservoir has a capacity of 3,000,000 barrels and has a length inside of the floor of 1,085 feet, a width inside of the floor of 490 feet and a depth of 31 feet. The entire structure including embankment occupies nearly 19 acres.



FOUR 7-8 MIXERS ON THE FOUNDATIONS FOR THE 2 PARK AVENUE BUILDING, NEW YORK

the excavation work for the foundation of this 35-story office building which is now nearing completion was done by the George J. Atwell Co., of New York. The construction work is in the hands of Schroeder and Koppel. The four Leach 7-8 mixers were sold by the Complete Machinery and Equipment Co., New York. This picture illustrates the advantage of a large number of smaller sized mixers placed strategically about a job, rather than one or two big mixers from which the concrete must be buggied to various points for pouring.

### Fair Represents Haiss in Great Lakes States

THE George Haiss Manufacturing Co., Inc., 142nd Street and Park Avenue, New York, has announced that D. H. Fair has been appointed District Representative in the Great Lakes States, making his headquarters in Chicago, Ill. Previous to this appointment, Mr. Fair was connected with the George Haiss Manufacturing Co. at its New York office.

### The Burch Corporation

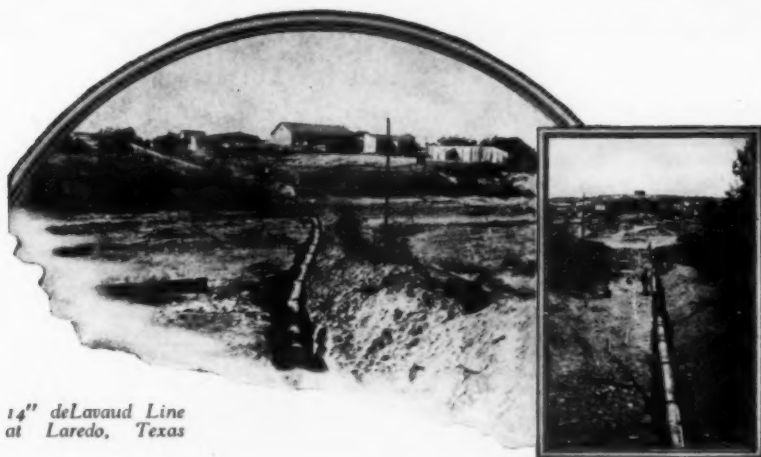
THE name of the Burch Plow Works Co., Crestline, Ohio, has been changed to the Burch Corporation. According to C. R. Beaver, Sales Manager, this change of name does not in any way change the policy or personnel of

the organization, which manufacturers Burch unloaders and stone spreaders.

### Climax Elects Officers

THE Climax Engineering Co., Clinton, Ia., has announced the election of George W. Dulany, Jr., as Chairman of the Board of Directors and Edward F. Deacon as President. W. E. Eberhart, Jr., was elected Treasurer. Both Mr. Deacon and Mr. Eberhart have been for some time assistants to G. W. Dulany, Jr., of the G. W. Dulany Trust with offices in the Harris Trust Building, Chicago, and will now relieve Mr. Dulany, Jr., of active responsibility for the Climax Co.

The executive offices of the Chairman of the Board and the President of the Climax Engineering Co. will continue to be in the Harris Trust Building, Chicago, Ill.

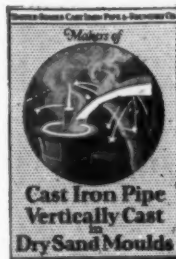


14" deLavaud Line  
at Laredo, Texas

## deLavaud Centrifugal Cast Iron Pipe in large diameters

OVER two and three quarter million lengths of deLavaud centrifugal pipe are now installed, in diameters from 4" to 20".

The many satisfied users find that the ease of handling deLavaud pipe is particularly true in the larger sizes—on account of its self-centering bell, and its lighter weight which, of course, is proportionately greater as the size of the diameter increases.



Write for special literature  
regarding the manufacture and  
of deLavaud centrifugal

# United States Cast Iron Pipe and Foundry Company

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### General Offices:

**Burlington, New Jersey**

Yes—we would like you to mention the CONTRACTORS AND ENGINEERS MONTHLY.



## How Connolly Moved 95,000 Yards of Sand and Clay in 65 Days

*Five-Yard Trucks with Hydraulic Hoists Make Task Easy*

**T**HE handling of 95,000 yards of sand and clay in 65 days' time is the record that the Connolly Contracting Co. set for the largest trucking job ever let in the Twin Cities of Minneapolis and St. Paul. This was done on the excavation work of the new Auditorium in Minneapolis. Twenty-eight 5-yard Mack trucks equipped with St. Paul hydraulic hoists were used to re-

move the dirt from this excavation, which covered two square city blocks and was 33 feet deep on all sides.

One of the main points of the Connolly organization's ability to handle big jobs in record-



**PART OF THE CONNOLLY FLEET OF MACK TRUCKS EQUIPPED WITH ST. PAUL HYDRAULIC HOISTS**

move the dirt from this excavation, which covered two square city blocks and was 33 feet deep on all sides.

Not being content with its record on the Auditorium job, the Connolly Contracting Co. is now working on one of the biggest highway jobs in Minnesota, moving 165,000 yards of rock. Like

many other successful contracting companies they attribute much of their success to the equipment used and, in the opinion of P. L. Connolly, who heads the organization, the combination of Mack trucks and St. Paul hydraulic hoists may be confidently counted upon.

### Another Aid for Road Builders



**BLAW-KNOX 5-TON TRUCK TURNTABLE MOUNTED ON WHEELS FOR PORTABILITY**



*Gustine Avenue looking north from Parker*

## St. Louis, Missouri



*Louisiana Avenue looking north  
from Bates*



*Montana Avenue looking east  
from Giles*

The thoroughfares shown in these photographs are typical residential streets.

### Stanolind Paving Asphalt

was used in the construction of these Sheet Asphalt pavements in 1924.

Whatever your paving problems may be, Stanolind Paving Asphalt will give you the greatest possible satisfaction. This product is an ideal paving material.

Our Road Engineers will be glad to furnish information concerning the proper use of Stanolind Paving Asphalt in the construction of all types of asphalt pavements. Phone or write our nearest branch office.

**[[Asphalts for Every Purpose]]**

## STANDARD OIL COMPANY

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Kansas City  
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St. Louis

## Tractor Converts Dense Forest Into a Golf Course

*Trees Felled, Boulders Moved and Ground Plowed Where Other Means Failed*

**T**REES and boulders of all sizes had to be removed, the ground plowed and harrowed, seeded and rolled when Yale University decided to make a golf course out of a dense forest. This was the problem faced by C. W. Blakeslee of New Haven. Work was begun with the felling of trees and the chopping and blasting of huge stumps. Donkey engines were installed, and a force of men put to work to fell, chop and blast. But the work proceeded too slowly. There were boulders that a team of horses could not budge.

Then a "Caterpillar" tractor was put on the job and it was found that the blasting and chopping of stumps was no longer necessary. All that was

in parallel were hooked up with the tractor, making four furrows at once.

Then the tractor was used for harrowing, and for rolling. It was also used with the 6-foot Fresno scraper, milling  $\frac{3}{4}$ -yard of dirt in one operation. This was also used on Yale's Polo Field, as well as the Golf Course. The hauling problem in the use of stones for a well and pipe line was also solved by the tractor. The sheet iron plates for the standpipe were pulled to location about 50 feet up a rocky knoll.

William E. Perkins, Superintendent of the job, in comparing the work done with a tractor with what it would actually cost with horses, pointed



PREPARING THE FAIRWAY OF THE NEW YALE UNIVERSITY GOLF COURSE BY MEANS OF A CATERPILLAR-TRACTOR

Top left, uprooting an oak tree a foot in diameter. Top right, skidding a donkey engine over mucky ground with the tractor. Below, plowing with the tractor and an Arkansas plow

required was a stout chain or cable fastened to a stump and hooked onto the back of the tractor. Smaller trees could be pulled out whole without any preparatory work, and trees up to 10 inches in diameter could easily be pulled without falling. In removing the boulders and stones, the tractor proved its superiority over the former method; a 2-ton boulder was pulled with a rolling hitch.

After the stones and boulders were removed, the tractor was used to plow the ground. Here the network of smaller roots and stones made the horse-drawn plow of little use. Since the ordinary plow wore out too quickly, the tractor was hooked to big Arkansas disc plows. Four of these plows

out that boulders were moved with a 2-ton tractor that would require 4 horses. Rent for teams is \$9.00 a day, or \$1.00 an hour, the driver included. A Caterpillar will do twice as much work in a day, and the only upkeep on the tractor is gasoline, which might be figured at \$2.00 or \$3.00 a day, with a man to operate, at \$5.00. On that basis, Mr. Perkins says that the tractor would do twice as much work for the same amount of money. On scraper work a tractor will do about three times the amount of work for the same money. For pulling stumps, the cost of a man to chop or blast the roots is eliminated; all that would be necessary would be to hitch the tractor on and pull them out.

## Water Supply without waste with Universal Pipe . . .

*. . . the only 100% cast iron pipe*

**T**HOUSANDS of miles laid every year. Easier, Quicker, Safer. Installed anywhere. Pipe and joint are "one". Experienced labor unnecessary.

No joints to calk. No lead substitutes. Nothing to deteriorate, nothing to work loose in its machine-tapered iron-to-iron joints—joints that are flexible, dependable, safe—joints that are *as tight as the wall of the pipe itself.*

Put your water supply, fire protection and sew-

age disposal problems up to our nearest office. Let us show you how much more economical, how much more dependable Universal Cast Iron Pipe really is.



### Good News!

SERVICE BOXES  
WITH STAY-ON  
COVERS

*Just what you have been  
waiting for . . . Inter-  
changeable with  
"Buffalo" boxes . . .*

Ask for MONITOR  
SERVICE BOX  
booklet.

## UNIVERSAL CAST IRON PIPE

No bell holes to dig. No joints to calk.

THE CENTRAL FOUNDRY COMPANY

Subsidiary of The Universal Pipe and Radiator Company

Graybar Building, 428 Lexington Avenue

Chicago Birmingham New York Dallas San Francisco

## New One-Man Power Scrapers

*Unit May Now Be Used With McCormick-Deering, Caterpillar and Cletrac Tractors*

**F**ULFILLING the demand for a road scraper that can be used not only with the Fordson tractor but also with larger tractors, The Miami Trailer-Scraper Co., Troy, Ohio, has brought out a one-man power scraper that may be used in connection with the 10-20 McCormick-Deering tractor, the 2-ton Caterpillar tractor and the 20-K Cletrac tractor. The illustration shows it being used with the Caterpillar tractor.

This new scraper is a very flexible piece of dirt moving equipment; it can be placed in the most difficult positions for both loading and dumping. The scoop pan is always under the control of the operator. The control is positive through the Miami power winch which is furnished with each scraper. This enables the driver to dump the load whenever or wherever he wants it.

The new models have all the features incorporated in the Fordson unit which this company has been manufacturing for several years. One new feature that will interest dirt movers is that the capacity of the pan has been increased to full  $\frac{3}{4}$ -yard.

Roller bearing wheel equipment allows the unit to be placed in almost unbelievable positions. After



**NEW ONE-MAN  $\frac{3}{4}$ -YARD MIAMI POWER SCRAPER WITH 2-TON CATERPILLAR TRACTOR**

the pan is filled to capacity the driver pushes forward on the lever and raises the pan out of the ground so that the front end is at about a 15 degree angle. In this position the load is transported to the dump on roller bearing wheels with a very slight loss even of a full rounded load.

## Proper Protection and Curing of Concrete Floors

*New Method and Material Prevents Efflorescence and Reduces Cracking to a Minimum*

**A** NEW material for the protection and curing of new concrete floors that eliminates the use of sand, sawdust, building paper covering, etc., is being manufactured by The Master Builders Co., 7016 Euclid Avenue, Cleveland, Ohio. During the curing period of concrete floors when they are subject to unusually severe usage and least able to withstand it, painters, plasterers and other trades move across and work over the new surface, often leaving marks that seriously injure and destroy the appearance of the floor. This new material Stainproof provides a dependable means of safeguarding the floor.

Stainproof is a jelly-like material specially prepared for application to new cement surfaces. Applied to the surface in a paint-like film thirty-six hours after the final troweling, this material dries to form a non-porous, viscous film through which paint, plaster, tobacco juice and similar staining agents cannot penetrate. This film is so tough that the heavy traffic new floors have to bear cannot grind through it to leave its marks in the cement beneath.

Over this film, painters, plasterers, and other workmen complete their work. Equipment is then moved in and set up. Workmen pass back and forth until the building is completed. Then, when the building is ready for occupancy, the film is removed, disclosing the new floor, unmarred and

clean.

Meanwhile, proper curing has been insured by the film which seals the original moisture in the topping, allowing slow and proper crystallization of the cement, and preventing too quick drying, the result of which is usually a weaker wearing surface.

In sealing the moisture in the cement, this film prevents efflorescence and reduces to a minimum crazing or hair checking, which is the result, directly or indirectly, of rapid evaporation of moisture from the cement mortar. By preventing this rapid evaporation, these two characteristic cement troubles are practically eliminated. After the film is removed a small amount remains in the pores of the floor as an insoluble compound, preventing absorption and giving a waterproof, smooth finish that takes polish easily.

Although developed principally for protecting and curing the Colormix floors of the manufacturers, Stainproof is suitable for use on new terrazzo floors, marble and stone floors, tile floors, wood floors, etc. Its use supplants ordinary sawdust, sand, building paper coverings, etc., and involves but little additional labor. According to the manufacturers, there are periods in the installation of each of these types when a protection of the kind this material and method supplies is of value to the job.



**FOR JOB-DRY MATERIALS**

BAGS = CEMENT	7.60
WATER-GALS = BAG	5.94
CU YDS = SAND	4.9
CU YDS = STONE	8.7

**PROPORTION (MIX)**

BAGS = CEMENT	7.60
WATER-GALS = BAG	4.94
CU YDS = SAND	4.7
CU YDS = STONE	.84

**FOR DAMP MATERIALS**

BAGS = CEMENT	7.60
WATER-GALS = BAG	5.94
CU YDS = SAND	4.9
CU YDS = STONE	8.7

## CONCRETE

FOR  
**PERMANENCE**

**PENN-DIXIE CEMENTS**

FOR  
**SERVICE - SAFETY**

**BUY AT  
PENN-DIXIE SIGNS**

BAGS = CEMENT	1.80
CU YDS = SAND	.14
CU YDS = STONE	.27

**THICKNESS IN INCHES**

BAGS = CEMENT	1.30
CU YDS = SAND	.14
CU YDS = STONE	.23

**1:2:4 MIXTURE**  
**1:2½:5 MIXTURE**

**QUANTITIES ABOVE ARE THOSE REQUIRED FOR:**

**100 SQ. FT.  
OF WALL OR FLOOR**

OF THICKNESS SHOWN

WITH PROPER MIXING, CURING AND TEMPERATURE CONDITIONS WATER AS SHOWN PER BAG OF CEMENT (AT LEFT) WILL GIVE UNIFORM STRENGTH. THE COMPRESSIVE STRENGTH OF SUCH CONCRETE AT 28 DAYS IS APPROXIMATELY 2800 LBS. PER S Q. INCH. 1000 LBS. FOR 1½" BARS, AND 1000 LBS. FOR 8 GALS. OF WATER PER BAG. INCREASE WATER FOR STIFFER MIXTURES. INCREASE AGGREGATE FOR MORE DURABLE MIX. REDUCES. ABOVE WATER SHALL STRENGTHEN YOU CAN SAVE MONEY ON LARGE WORK BY DETERMINING THE MATERIALS TO BE USED. DATA ON THIS RULE ARE FOR AVERAGE CONDITIONS.

CLEAN GRADED SAND AND STONE OR PEBBLES ¾" TO 2" IN QUANTITIES AS GIVEN ABOVE ARE REQUIRED FOR:

ONE CU. YARD OF FRAMMED CONCRETE

ONE BAG OF CEMENT = 1 CU. FOOT  
ONE BAG OF CEMENT WEIGHS 94 LBS. NET  
ONE BARREL OF CEMENT = 4 BAGS

COPYRIGHTED 1937 UNITED MTL. CO. CHICAGO, ILL. U.S.A.

ACTUAL SIZE REPRODUCTION OF CONCRETE AND LUMBER SCALE

ASK FOR ONE—THERE IS NO CHARGE

# PENNSYLVANIA-DIXIE CEMENT CORPORATION

131 EAST 46TH STREET  
NEW YORK CITY

JAMES BUILDING  
CHATTANOOGA, TENN.

OFFICES AND SALES REPRESENTATIVES THROUGHOUT  
THE EAST AND SOUTH

## BUFFALO-SPRINGFIELD ROLLERS



All Types and Sizes  
With or without Scarifier attachment  
Helps you finish the job on time

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for complete  
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**The Buffalo-Springfield Roller Co. SPRINGFIELD OHIO**

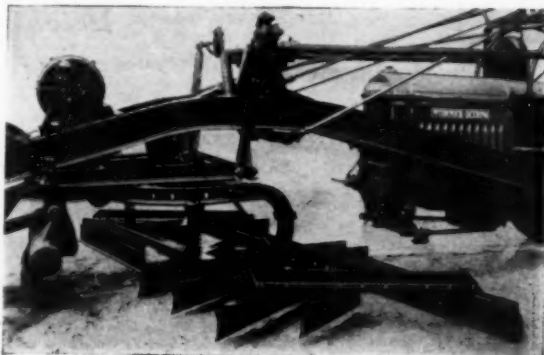
Please mention the CONTRACTORS AND ENGINEERS MONTHLY—it helps.

## An Improved Motor Grader

*Permits Leveling Roads and Maintaining Grade at the Same Time*

SEVERAL new features mark the introduction of an improved motor grader by The Galion Iron Works & Manufacturing Co., Galion, Ohio. One of these improvements is the platform controlled scarifier which permits loosening up gravel and stone surface which cannot be leveled by the blade alone. A special "bottom" for the McCormick-Deering motor grader of this company replaces the regular straight blade, being attached to the semi-circle. The change can be made in a short time. This new attachment works over the surface, blading it back and forth and filling all holes, ruts, and hollows.

The long wheel base, 16 feet and 3 inches, and the heavy weight of the grader, body and frame, combined with the power of the tractor, hold this new work and permit leveling roads and maintaining type of maintenance "bottom" firmly to its proper grade at the same time.

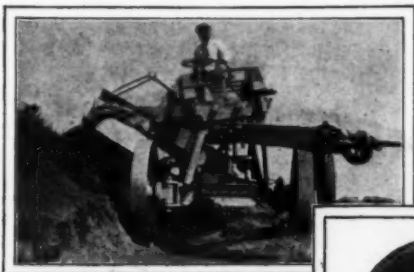


**MULTIPLE BLADE ATTACHMENT FOR GALION McCORMICK-DEERING MOTOR GRADER**



**A BELLE CITY STANDARD GAUGE CRAWLER WITH LESSMAN LOADER DIGGING BASEMENT IN THE RESIDENTIAL SECTION WEST OF CHICAGO LAST WINTER**

This view was taken when the thermometer was at 10 degrees below zero. It was only necessary to loosen up the frozen skin, after which the tractor-loader unit operated as readily as in the summer time. The basements were being dug at the rate of one every five hours. This is an interesting demonstration of how contractors can operate profitably during extreme cold weather in the winter.



Superior points which make the Rome worthy of investigation



## The Disc Wheel

### A New and Valuable Feature on GRADERS

Pat. Nov. 17, 1925  
No. 1,561,643

Our competitors admit it. Made in the Rome patented way, it is correctly adapted to the work it has to do. It does not easily get mired. It does not tear but trowels and smooths the bank.

Other patented features are the High Lift, patented May 17, 1927, No. 1,662,4, and the Knuckle and Spindle type Steering Gear, patented May 24, 1927, No. 1,629,573.

Superior prints which make Rome worthy of investigation.

ROME MANUFACTURING COMPANY

Locomotive Dept.

ROME, NEW YORK

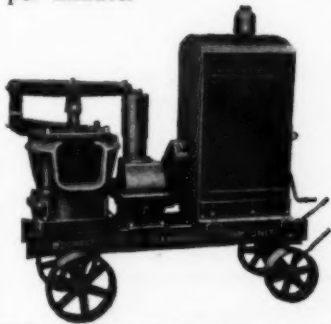
PATENTED  
**ROME HIGH LIFT GRADERS**

## YOUR FIRST CONCERN IS — WATER —

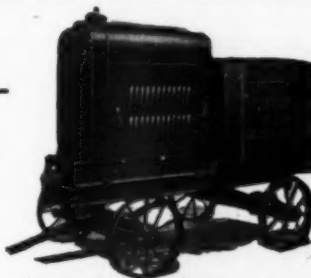
*Either you NEED it for the shovel or mixer and haven't got it, or you've GOT IT in a hole or a trench where you don't want it.*

If you need a never-failing supply of water a "Domestic" GIANT self-oiling Triplex is the pump outfit you are looking for.

Built for capacities 80, 100 and 150 gallons per minute.



"Domestic" DL-4 Diaphragm Pump Unit



"Domestic" 35-A GIANT Road Pump Unit

To rid that job of excess water the "Domestic" new improved self-oiling, enclosed engine type Diaphragm Pump Unit is your "best bet." They get the water out of the hole in a "jiffy" and keep the trench or foundation absolutely dry.

Built in single and double pump types—capacities 8,000 to 24,000 gallons per hour.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_

State \_\_\_\_\_  
**DOMESTIC ENGINE & PUMP CO.,**  
SHIPPENSBURG, PA.  
Mail me at the above address complete descriptive literature covering  
☐ Giant Triplex Road Pump  
☐ "Domestic" type Diaphragm Pump  
CEM  
10-27

## A New 5-Ton Tractor

*The Number of Parts of This Unit Has Been Decreased Considerably and the Weight and Power Increased*

THE aim of The JT Tractor Co., Cleveland, Ohio, in bringing out its new Model "45" crawler type tractor has been, in general, to increase the size of all the parts and decrease the number so that they will be less subject to wear, have fewer parts to work loose, and suffer less through rust from exposure. The weight and power of the tractor have been increased—it is a full 5-ton tractor weighing over 10,000 pounds and has a 45-horsepower Climax engine.

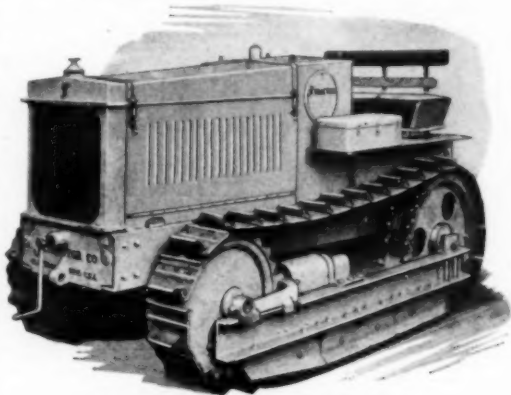
The yoke operating the front wheel has been simplified. It is now carried by the top flange of the side channels, and is so shaped that the dirt cannot get under it to clog and prevent its functioning. The tension spring behind the yoke is entirely encased in a steel casting and a mud guard is provided over the adjusting nuts. The adjusting nuts are made of brass and have a square thread, to prevent them from rusting to the adjusting screw.

The rear end of the side truck has been improved by new rear axle boxes. The inside one is inside the frame axle box, which gives a long bearing on the axle to resist any side motion on the truck frame. The rear wheel is mounted on Guernsey ball bearings entirely protected from dirt and dust. The rear drive gear is an external gear and has been entirely encased in a dirt proof housing which allows it to run in oil. These housings are easily removed for inspection, or replacement of parts.

The bull pinion shaft is carried on two large Guernsey ball bearings and is so inserted in a housing that it not only runs in a bath of oil, but can be removed without taking off the rear wheel. The bull pinion is housed in a dust proof casing and also runs in oil.

Steering brake wheels have been increased in both diameter and width, to decrease heating, and to make steering easier for the operator. The brake band adjustment has been greatly simplified. The differential housing has been moved back and a new type of Universal coupling is being used which can be disconnected, leaving enough space to allow the transmission to be taken out without disturbing the engine or differential.

The main frame is made of two heavy Bethlehem 10-inch beams with flanges  $3\frac{1}{2}$  inches wide, and has almost twice the strength where it is trussed to take the drawbar attachment of the old



THE NEW MODEL 45 JT TRACTOR

frame. It gives a much stiffer mounting for the engine and front and rear axles, and allows of better lateral cross bracing.

The gasoline tank support is made of pressed steel plates securely riveted together. The tank is entirely enclosed to prevent damage from without, and the tank support is about six inches lower than in the older models, thereby improving the operator's forward vision. The front engine support is one steel casting, supported on top of the beams and the engine has a three point support on the frame, so that any distortion of the frame will not distort the engine casting.

The front axle support is one steel casting securely bolted to the under side of the frame. The radiator support is a single steel casting securely fastened to the web of the frame channels. It has provision for a clevis to be used in pulling loads backwards. The seat support is made of steel plates and is arranged to hinge forward so that the differential and brake hands are made more accessible.

The drawbar is supported on springs in a trunion of very simple design, on the underneath side of the frame, at the approximate center of gravity of the tractor. It extends to the rear and under the rear axle, and is supported at the back in a casting which allows longitudinal movement. The position of this casting can be changed and fixed in any position from one side of the frame to the other.

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*Distributors of construction equipment are able assistants to contractors. They sell good machinery, service it promptly when called upon and are always ready to help with layouts and economic hints picked up in their close contact with the industry. See the list of Distributors on pages 155 to 191 of this issue of CONTRACTORS AND ENGINEERS MONTHLY*

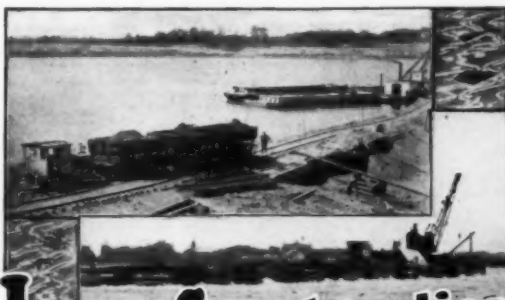
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**Q**UALITY has always been an inbuilt characteristic with Whitcomb Locomotives. Speed in every unit is guaranteed by "more horse-power per ton of weight."

The quickest and most economical way to move materials is with a "Whitcomb." 30 to 40 cars, 1,000 tons or more, are easily hauled by a 25-ton "Whitcomb." All sizes having a much greater haulage capacity than similarly rated steam dinkies.

Low center of gravity, short overhang and high track clearance guarantee satisfactory operation over uneven, temporary tracks. Unlike trucks or wagons, "Whitcombs" never become mired, and are unaffected by weather conditions.

Use "Whitcombs" on your contract. All sizes from 30 to  $3\frac{1}{2}$  tons and any gauge can be shipped promptly. Write or wire for complete data and shipping promise.



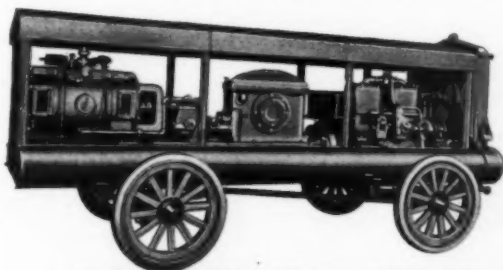
## Levee Construction

The speed and thoroughness with which broken levees in the Mississippi Valley are replaced is entirely dependent upon the quality of equipment used. "Whitcombs" have proved their worth on levee construction work.

**GEO. D. WHITCOMB COMPANY**  
Rochelle, Illinois

Offices in Principal Cities

## THE AIR COMPRESSOR OF UNMATCHED EFFICIENCY FOR EVERY JOB



**TAYLOR PORTABLE COMPRESSORS** are of proven efficiency. You can depend on them. They operate smoothly and powerfully, making the air where and when you want it for all kinds of pneumatic tool work.

**HORIZONTAL TYPE—DOUBLE ACTING—SLOW SPEED**

Assuring High Efficiency and Long Life With Low Upkeep

Send the Coupon for Full Information—Now!

**CEMENT-GUN COMPANY, Inc.**

Allentown, Pa.

New York, Pittsburgh, Chicago, Denver, Salt Lake City, San Francisco, New Orleans, Buffalo

Also write us for information on the "CEMENT-GUN" and its sand and cement product, "GUNITE."

Cement-Gun Co., Inc. Date.....  
Allentown, Pa.  
Please send full information on the TAYLOR PORTABLE COMPRESSOR. ☐  
I would like to have your representative call. ☐  
Name .....  
Address .....  
City ..... State .....



## Locomotives for Road Building Transportation

*Economical, Efficient and Adaptable to Almost Any Condition*

**F**OR ease of operation, practicability in all kinds of weather, and low cost per ton mile, gasoline locomotives are being manufactured by the George D. Whitcomb Co., Rochelle, Ill., for conveying materials for road building. These locomotives are built in all sizes, from 2 to 25 tons on the drive-wheels and in gauges varying from 18 to 60 inches.

In road building, where the main problem is the transportation of materials from the railroad receiving point to the mixer, and at the same time maintaining cleanliness of materials and uniformity of delivery at the lowest cost, the economical method is the industrial or narrow gauge railroad. It has a flexibility which allows its adoption regardless of conditions, and the materials carried in batch box cars arrive at the mixer clean, in the correct proportion and with a continuity unobtainable by other methods.

At the railroad point of delivery the materials are, as a rule, transferred to elevated hoppers by a locomotive crane. The industrial track running under these hoppers allows almost instantaneous transfer to the batch boxes beneath, measuring chutes allowing sufficient sand, gravel and cement, where bulk cement is used, to go into each box, so that further measuring at the mixer is avoided. As a rule, one locomotive with a low or removed cab is held to serve the hoppers, thus avoiding excessive elevation of the hopper structure. At some points the railroad cars are unloaded from a trestle with the hoppers beneath. At other points the loading is done from the ground level, the track being laid in a tunnel beneath the hoppers or loading platform. In any case the batch box cars are readily and accurately loaded. When the cement is stored in bags, the train is run alongside the warehouse and the proper amount of cement added to each box.

The track employed is usually a 20-pound steel



**EASY METHOD OF CROSSING INTERURBAN TRACKS**

rail, put up in 15-foot sections, with seven pressed steel ties to the section. It is readily laid and easily moved, and can be laid from the railroad delivery point to the junction with the highway with very little grading. At convenient points passing tracks may be installed, allowing the use of two or more trains. At intersections with interurban or railroad tracks, removable sections are laid and removed as soon as the train has passed, so as not to obstruct such interurban or railroad track. Where permission cannot be obtained for crossing such tracks, the industrial track can be laid through some culvert and the train with cab removed can run under such tracks.

The industrial track equipment shows its real worth at the mixer. The track is carried not in the center of the road, but on either shoulder, allowing the work of subgrading, fine grading, and rolling ahead of the mixer to be carried on without interruption of breaking down of the subgrade, as is always done where track haulage is used. In wet weather a good deal of valuable time is saved because the material can be hauled to the mixer as soon as the subgrade is dry enough for cement. At the rear of the mixer the tamping and finishing can be done without interference, and the cement can be covered as soon as it is dry.

When the train loaded with batch boxes arrives at the mixer, each batch box is lifted from the car and dumped into the mixer as it is needed, and the empty box dropped back in place. The train is moved along a car length at a time, until all the material has been disposed of. This is advantageous, in that the materials do not touch the ground during their transportation and can comply with the specifications in some states for washed materials. Another advantage is the absence of materials left along the side of the highway at finished points, sometimes amounting to 10 to 15 per cent.

In many installations the industrial tracks parallel the railroad tracks and the gasoline locomotives are often used to switch the railroad cars, a rope or pole being used to make connection.



**TRESTLE METHOD OF HANDLING MATERIALS**

## American Steel & Wire Company's

### WIRE FABRIC

"The Steel Backbone for Concrete"



Flat Sheets Loaded on Cars

### Prompt Deliveries mean Profitable Contracts

**T**HE American Steel & Wire Company with its unequalled facilities and large stocks is in position to make prompt deliveries of Wire Fabric Reinforcement.

This means profitable fulfillment of your contracts. Write or wire for quotation on current requirements.

American Steel & Wire Company

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INDIANAPOLIS.....	Union and Farmers Bank Bldg.	SAN FRANCISCO.....	Banker Bldg.
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SEATTLE.....	First National Bank Bldg.	PORTLAND.....	101 & Alder St.
SALT LAKE CITY.....	Walker Bank Bldg.	SEATTLE.....	410 Ave. So. & Cona. St.

\*United States Steel Products Company

## BLYSTONE

### MIXERS

**For thoroughness  
and speed**

Blystone speed and thoroughness mean time-and-money-saved on any construction job.

Blystones are suited to almost all kinds of mixing work, but are especially adapted to mixing concrete, mortar and plaster.

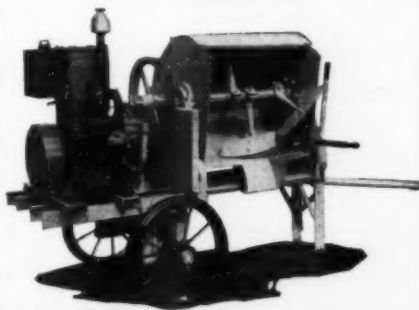
Blystones use 30-40 per cent more sand than when plaster is mixed by hand.

One Blystone will mix plaster for 25 plasterers.

Blystones give satisfaction.

Write for the Blystone circular

**Cut your mixing  
costs with a  
BLYSTONE**



**BLYSTONE MFG. COMPANY**  
1027 C Street Cambridge Springs, Pa.



## Made for Your Service

THE catalogs and pamphlets listed below are available for free distribution. Contractors and Engineers who check over these pages each month and write for such material as interests them, will find this a valuable means of keeping up to date on the subject of machinery and equipment.

### LOCOMOTIVES IN 1- TO 9-TON CAPACITIES

Gasoline locomotives, Fordson-equipped, for hauling dirt and supplies and running concrete, in 1- to 9-ton capacities, that combine efficiency with economy, have 20-inch drivers, 36½-inch wheel base and high-grade spring locomotive journals under all four drive wheels, are manufactured by the Brookville Locomotive Co., Brookville, Pa.

### A SELF-LOADER FOR MATERIAL HANDLING

Write to the F.S. Mfg. Co., Inc., New Holstein, Wis., for information and prices of the Arps's self-loader for carting of gravel or crushed rock, snow removal, delivering coal, or the removal of any loose materials, that has an average travel of 9 miles per hour and on the basis of \$1.00 per yard has an earning capacity of \$70.00 per day.

### A NEW CRANE FOR CRAWLER TRACTOR

The new Whitehead & Kales portable crane mounted on the model D Trackson full-crawler-equipped Fordson, for heavy work in difficult ground conditions is fully described in literature which will be sent by the Trackson Co., 519 Clinton Street, Milwaukee, Wis., on request.

### DEPENDABLE POWER FOR CONTRACTORS' MACHINERY

Bulletins describing Climax engines for cranes, shovels, hoists, pumping units, electric generator units and Climax portable power units from 40 to 140 horsepower, may be secured by writing to the Climax Engineering Co., Clinton, Iowa.

### FULL REVOLVING GAS OR ELECTRIC SHOVEL-CRANE-DAGLINE

A new catalog, describing the Speeder full-revolving, gas or electric powered, full crawler mounted, all steel, shovel-crane-dagline, which is mounted on an electrically welded structural steel base and incorporates many superior features of design, will be mailed on request by the Speeder Machinery Corp., 1215 South 6th St., W., Cedar Rapids, Iowa.

### TRACTOR-POWERED SCRAPERS

Circular S-26-269, issued by the Gustav Schaefer Wagon Co., 4180 Lorain Ave., Cleveland, Ohio, describes Schaefer scrapers which load, dump, spread and level by tractor power, all being controlled by the driver without moving from his seat.

### HELPING THE CONTRACTOR "GET HIS"

This is the title of a folder recently issued by the Bay City Dredge Works, Bay City, Mich., describing the Bay City 16-B excavator, a heavy-weight skimmer, ditcher, and plecturing numerous jobs on which it has been used successfully and economically.

### HEAVY-DUTY DUMPING EQUIPMENT

Designed to meet the requirements of the State Laws as regards tonnage distribution, The Heil Co., 1242-69 26th Avenue, Milwaukee, Wis., has equipped a 6-wheel Fagcol heavy-duty truck for use with the Heil hydraulic hoist. Particulars as to size and construction will be furnished gladly by the manufacturers.

### COMPRESSOR PLANTS IN TWO SIZES

Descriptive catalog No. 801 of the National Brake & Electric Co., Milwaukee, Wis., gives full particulars and illustrations of complete compressor plants consisting of air compressor and gas engine which come in standard sizes of 110 and 160 cubic feet piston displacement per minute. This catalog is free to interested parties.

### A HEAVY-DUTY CARRY-ALL TRAILER

A new heavy-duty carry-all trailer, designed especially for transporting steam shovels and similar equipment at motor truck speed rather than under their own power, in capacities of 30, 35 and 40 tons, is fully described in the literature of the Fruehauf Trailer Co., Detroit, Mich.

### A MIXER FOR PLASTER AS WELL AS CEMENT

Circulars describing a machine that mixes plaster with the same efficiency as concrete, doubles the plaster production with half of the men ordinarily required, requires less lime and gypsum, and gives a better mix than the hand method, will be sent to contractors by The Standard Scale & Supply Corp., First Avenue, Pittsburgh, Pa.

### A CONTRACTORS' SELF-PRIMING PUMP

Bulletin No. 29 describes and pictures a contractors' portable, centrifugal, self-priming pump, with belt, motor or gasoline engine drive of The La Bour Co., Chicago Heights, Ill. It retains its prime even if air is admitted at the suction, and will handle dirty water. Write for this bulletin.

### A NEW GOVERNOR ATTACHMENT

Description of a new model governor for the 17-28 "Twin City" tractor that can be easily and quickly installed and will deliver smooth, steady, uniform and cheap power, as well as information about governors for McCormick-Deering, Fordson and other tractors, will be furnished on request by The Pickering Governor Co., Portland, Conn.

### A MANUAL ON HOISTS AND HOISTING WORK

The Novo Hoisting Handbook, a manual containing valuable information about hoists and hoisting work and illustrated with pictures and diagrams of various jobs, has just been revised by the Novo Engine Co., Lansing, Mich. Interested contractors and city officials may receive a copy on request.

### A NEW LEANING WHEEL GRADER CATALOG

Under the title "The Long and Short of it" the Austin Manufacturing Co., Chicago, Ill., has issued a new folder describing the new features of Austin telescopic axle leaning wheel graders.

### A NEW OIL-BURNING TAR HEATER

The Joseph Honhorst Co., 1016 West 6th St., Cincinnati, Ohio, in its pamphlet No. 16, describes the new Honhorst oil-burning tar heater which embodies the most modern principles in design and construction and is superior to heaters using solid fuel with their consequent smoke and irregular heat. The oil burner and kettle as well as its new features, including a perforated division plate are described in this pamphlet.

### BARROWS, SALAMANDERS, CARTS, ETC.

Wheelbarrows, concrete carts, mortar boxes, salamanders and other contractors' equipment that are intelligently designed and proportioned, durably built and sold at a fair price, are described in literature which General Wheelbarrow Co., 3140 East 65th Street, Akron, Ohio, will be glad to send on request.

### A NEW 6-CYLINDER DUMP TRUCK

A new 6-cylinder, 2-ton dump truck with 4-speed transmission and selective gear ratios in the rear axle, 4-wheel Lockheed hydraulic brakes and a chassis built for the unusual stresses of dump truck work, is described in a catalog which Graham Brothers, Detroit, Mich., have just issued.

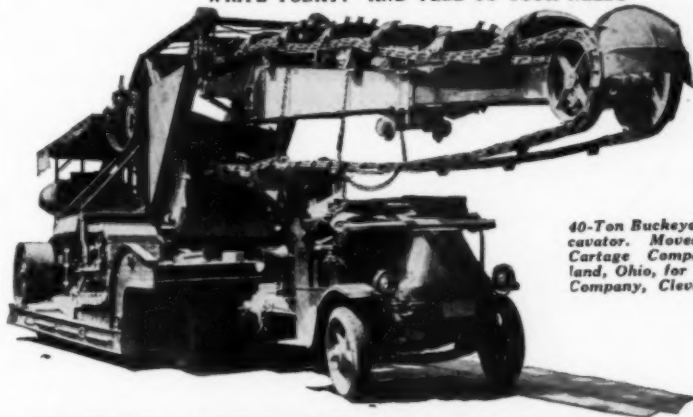
## LIKE THE STRONG MAN

The strong man handles enormous weights. Endowed with great strength he must ever be ready to resist unusual strains. Like a strong man, Rogers Heavy Duty Gooseneck Trailers handle enormous weights. Reinforced at every point to insure maximum strength, they too, resist unusual

strains. In addition to transporting heavy loads safely and speedily, Rogers Trailers save loads, roads, time and money.

Rogers Heavy Duty Gooseneck Trailers are built to meet any requirement.

**WRITE TODAY! AND TELL US YOUR NEEDS**



40-Ton Buckeye Trench Excavator. Moved by Brown Cartage Company, Cleveland, Ohio, for the Kassouf Company, Cleveland, Ohio.

**ROGERS BROTHERS CORPORATION, Albion, Pa**



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REGISTERED

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More Miles Have Been Covered by the KINNEY Distributor than by any other heater and distributor in the world.

**The KINNEY Heater and Distributor**

will properly heat and apply the heaviest asphalts and tars as well as the lighter grades of bituminous road material with equal efficiency and with the least expenditure of time, labor and money.

Equipped with the Kinney Positive Pressure Pump and the Kinney Spraying Nozzles and circulating and heating systems. Self-loading from tank cars.

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**BOSTON, MASS.**

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**ENGINES FOR HEAVY DUTY**

Engines of great simplicity of design, that will withstand the constant strain of ditch digging, that are dependable, and that start only when the switch is thrown in and stop only when it is thrown out, are manufactured by the Hercules Motors Corp., Canton, Ohio, which will send descriptive matter on request.

**PORTABLE BELT CONVEYORS**

Bulletin No. 65 of The Fairfield Engineering Co., Marion, Ohio, describes and illustrates portable belt conveyors that increase the handling of sand, gravel, crushed stone and other abrasive materials and decrease the time and money involved.

**SELF-PROPELLED STONE CRUSHER**

A self-propelled steel jaw portable stone crusher, fully equipped with folding elevator and movable bins or chute screens, operated by Fordson or McCormick-Deering power, that is a time and money saving unit, and may be put into instant operation by a single shift of the clutch, is described in Bulletin No. 127 of the Acme Road Machinery Co., Inc., Frankfort, N. Y.

**A NEW TRACTOR CATALOG**

The Bates Mfg. Co., Joliet, Ill., has issued a new catalog describing Bates tractors which have a large power reserve and unusually large full-length crawlers which assure positive traction in the softest and most slippery going.

**TIE BOLTS FOR CONCRETE WALL FORMS**

An interesting circular describing Hawley tie bolts which hold wall forms in exact position so that they cannot slip and permit the easy removal of the forms, may be secured from the Williams National Form Clamp Co., 26 West Kinzie St., Chicago, Ill.

**A NEW 3-SPEED HOIST FOR CONTRACTORS**

The Mundy Sales Corp., 30 Church St., New York, will gladly send a copy of its folder fully describing the Mundy three-speed hoist which has power, speed, quick change of pace and line pull all at the instant command of the operator.

**A NEW EXCAVATING AND MATERIAL HANDLING BUCKET**

Complete information, including specifications and prices, regarding the new Orton clamshell buckets made in sizes from  $\frac{1}{2}$  to 5 yards will be sent without obligation by the Orton Crane & Shovel Co., 608 South Dearborn St., Chicago, Ill., to contractors interested in this improved bucket for all types of excavating and material handling.

**A NEW LINE OF AIR COMPRESSORS**

A new line of portable gasoline engine driven air compressors that can be supplied on any standard mounting, and that come in three sizes of 6-inch x 4 $\frac{1}{2}$ -inch, 8-inch x 6-inch, and 9 $\frac{1}{2}$ -inch x 6-inch bore and stroke, is described in a circular which the Gardner-Denver Co., Denver, Colo., will send on request.

**A CRANE FOR LIGHT TRUCKS**

A truck crane for mounting on comparatively light trucks, designed to meet the requirements of the average contractor for reasonably priced equipment, is of substantial construction and made to fit the truck without the necessity of drilling holes or altering the mechanical construction of the truck. Write to the Squier-Rix Co., 373 Broadway, Milwaukee, Wis.

**PROPER CONCRETE MIXTURES**

The Portland Cement Association, 33 West Grand Ave., Chicago, Ill., has issued a very helpful free booklet "Design and Control of Concrete Mixtures" which should be in the hands of every contractor interested in concrete of known strength and quality.

**A LOADER THAT DOES MORE WORK**

Catalog 523 and a list of owners will be sent free to those interested in a heavy-duty loader that is the only loader with toothed buckets, simple propeller, self-feeding device and slow speed crowding motion that has reserve strength and power to handle heavy work. Write to the manufacturers, the George Hains Mfg. Co., Inc., 142nd Street and Park Avenue, New York City.

**ALL STEEL NON-TILTING MIXERS**

Catalog No. 27 recently issued by the Leach Co., Oshkosh, Wis., describes Leach-Oshkosh all-steel, non-tilting 7-S mixers, as well as the new 10-S mixer which is built along the same lines as the 7-S.

**LOCOMOTIVES FOR ROAD BUILDING TRANSPORTATION**

Bulletin No. 2411 of the Geo. D. Whitcomb Co., Rochelle, Ill., describes and illustrates a line of gasoline locomotives for transporting road building materials, that come in all sizes, from 2 to 15 tons on the drive-wheels, and in gauges varying from 18 to 60 inches, and that are economical, efficient and adaptable to almost any condition.

**HEAVY-DUTY TRAILERS**

Heavy-duty Gooseneck trailers built to handle enormous weights, reinforced at every point to insure maximum strength, and that transport heavy loads safely and speedily, save time and money, and are built to meet any requirement, are described in literature of Rogers Bros. Corporation, Albion, Pa.

**A NEW AND FASTER PAYER**

The 1927 Paver Catalog of the Chain Belt Co., 766 Park St., Milwaukee, Wis., is easy to read, and tells all the details of the new Rex 27-E paver that is built for new speed and strength, and that produces more yards, more seasons and more profits. It is free on request, to interested contractors.

**A COST-CUTTER ON MIXING JOBS**

The circular of the Blystone Mfg. Co., 927 C Street, Cambridge Springs, Pa., is now available. It describes a thorough mixing machine that has spiral arrangement of its shovels that carry the materials from one end of the drum to the other twice in every revolution of the shaft, or 50 times each minute, and reduces mixing costs to a minimum.

**NEW REDUCED PRICES ON HOISTS**

"O.K." catalogs describing hoists, portable elevators that save time in hoisting brick, mortar, etc., and portable air compressors, and on which new reduced prices have been placed, are available for distribution to interested parties, by the O.K. Clutch & Machinery Co., Columbia, Pa.

**A NEW UNIT OF PAINT SPRAY EQUIPMENT**

An 8-foot extension and paint gun, designed particularly for painting ceilings, high walls, ship sides, tanks, freight cars, gondolas and other high surfaces without the use of so many ladders or scaffolding, and which save time and money, has been brought out by The Alexander Milburn Co., Baltimore, Md., and is described in literature which is available on request.

**DREDGING ENGINES FOR CONTINUOUS SERVICE**

A high grade machine for heavy continuous service for driving centrifugal dredge pumps where greatly varying loads are encountered, that is economical in that the possibility of shut-downs is overcome and the full horsepower maintained, is described in a pamphlet of the Murray Iron Works Co., Burlington, Iowa.

**CONCRETE AND STEEL BULLETINS AVAILABLE**

Bulletin 26 of the Pittsburgh Testing Laboratory, Pittsburgh, Pa., entitled "Better and Stronger Concrete" and Bulletin 22, entitled "Progressive Inspection and Testing of Structural Steel, Cement, Etc.," are available to contractors and engineers free on request.

**NEW ONE-MAN POWER SCRAPERS**

Two new models of one-man scrapers to be used with the 10-20 McCormick-Deering and the 2-ton Caterpillar tractors, that have all the features of the Fordson unit of this company plus a new feature of the pan capacity increased to  $\frac{1}{2}$  of a yard, is manufactured by The Miami Trailer-Scraper Co., Troy, Ohio, which will send details on request.

**A NEW 5-TON TRACTOR**

A new model full 5-ton tractor weighing over 10,000 pounds, that has a 45-horsepower Climax engine, larger and fewer parts subject to wear, work loose and rust, is being produced by The JT Tractor Co., Cleveland, Ohio, which will be glad to send particulars to interested contractors and engineers on request.

**WOOD OR COAL BURNING KETTLE**

You will eliminate the waiting for hot materials by using a Type 69 fast heating wood or coal burning kettle that is quality built throughout, has all welded kettle, superior roller bearing spring cushioned running gear with rubber tired wheels and barrel hoist optional. Littleford Bros., 485 East Pearl Street, Cincinnati, Ohio, will send details on request.

**SILICATE OF SODA FOR CURING CONCRETE**

R-B silicate of soda, manufactured by the Grasselli Chemical Co., Cleveland, Ohio, is described in a new booklet issued by this company which tells all about its use in curing concrete roads, streets and bases.



For 5 minutes—watch a

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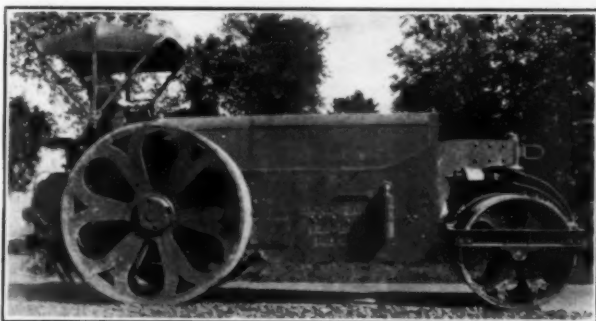
## MOTOR ROLLER WORK

Five minutes of any contractor's time will prove Huber's worth. Huber four-cylinder Motor Rollers are made in four sizes (5-7-10-12 tons). They are as dependable as the modern automobile. Look to Huber for the easy single-lever control—short turns—quick action—and no shifting of gears. You need all these features—they help you make money.

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5-7  
TONS



10-12  
TONS

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### SEMI-TRAILER-TRACTOR HITCH

Motorizes Horse-Drawn Equipment  
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**REDUCES HAULAGE COSTS**

The TRAIL-IT Hitch is used by many Trailer and Wagon manufacturers as standard equipment.



**DIRT MOVERS  
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We can **SAVE**  
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## TWIN BACKFILLER

**BACKFILLS  
SHOULDERS-ROADS  
CLEANS DITCHES  
EXCAVATES**

**On any contract  
where you can  
use one or two  
scrapers this ma-  
chine will pay for  
itself.**

This unit mounted on a Fordson has made many friends—because of its many uses—because it stands up and does its work under all conditions—and because it **SAVES REAL MONEY.**

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## DON'T WORRY

When you strike water on a job, buy a HUMPHRYES HIGH CAPACITY DIAPHRAGM PUMP and be sure of getting the continuous, heavy-duty service you need.

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State by state after exhaustive tests is adopting the Dowflake method of curing concrete, getting a better job done faster at half the cost.

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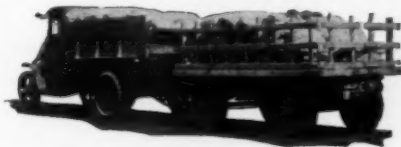
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### HIGHWAY TRAILERS

For Machines: Shovel, Crane, Roller, Trencher, Paver, Mixer and Compressor.

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Two, four, six and eight-wheel types — one-half to fifty ton capacities. Write for Bulletin.

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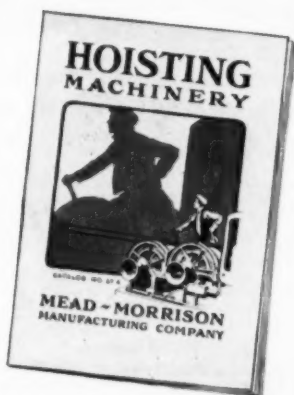
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Mead-Morrison hoisting equipment includes gasoline, electric, belt and steam machines in types and sizes for every class of work. Mead-Morrison hoists are noted for their strength, dependability and long life.

*"Ask any operator"*

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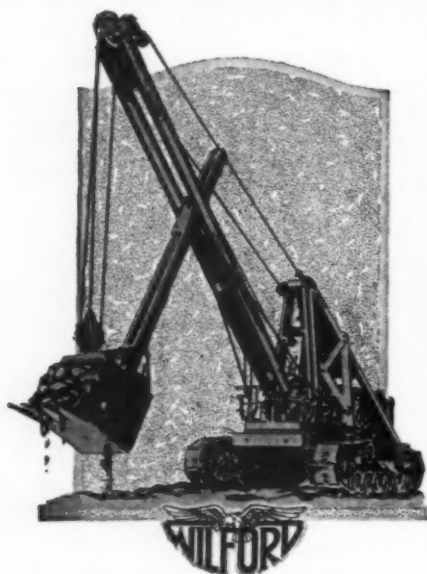
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The Wilford is quickly transformed to Crane, Clamshell, Trench Hoe, Dragline and Backfiller through the use of interchangeable booms.

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## "Give Me My Sullivan Spader"

"I can drive 5 ft. more tunnel a day with the Sullivan Spader than with any other, and I'm going to have it back." That's what a laborer on a sewer job in Maumee, Ohio, said when they tried to exchange his Sullivan Spader for just an air-driven spade.



Sullivan Spaders and Sullivan Portable Compressors will cut your pick-and-shovel gangs in half on clay-digging jobs.

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## The Euclid Rotary Fresno



### Outstanding Euclid Features:

**Capacity Durability Ease of Operation**

An extra deep bowl with a high draw-bar clearance gives the Euclid more than the ordinary Fresno capacity.

Heat-treated alloy-steel in shoes and blade gives long life to these parts. The heavy draw-bar of steel channel and tube construction and the well braced bowl give excess strength. The Euclid Frame is built in sizes to suit every tractor from the Fordson to the largest crawler.

Only two short, light pulls on the trip lever are required for operation: one for loading, and one for dumping. The scraper loads without holding onto the lever and the cut releases automatically.

**Write today**

Ask for the new earth-moving equipment folder which gives all information on the complete Euclid line.

**The Euclid Crane & Hoist Co.**  
108 Chardon Rd. Euclid, Ohio

## ARPS'S SELF-LOADER FOR TRUCKS



In a recent demonstration for the city, we loaded, delivered and unloaded seven yards of gravel, with an average travel of 9 miles per hour.

A team of horses with two men loading averaged  $1\frac{1}{2}$  yards of gravel per hour. On the basis of \$1.00 per yard, the ARPS'S Self-Loader had an earning capacity of \$70.00 per day.

It will pay you to look into the merits of this machine in connection with your material-handling, whether it be the carting of gravel or crushed rock, snow removal or delivering coal, or the removal of any loose materials.

*Write for further details and prices*

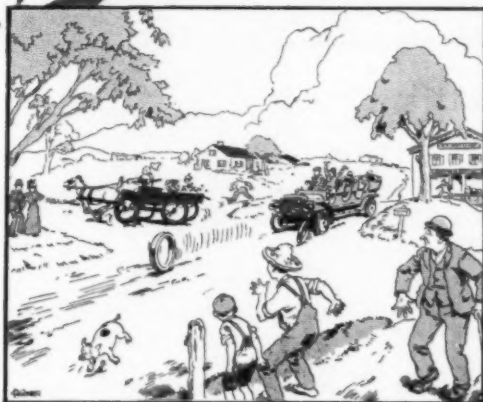
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**BACK IN 1900** *were Standard Equipment*



THE incident pictured is the seventh of a series based upon actual happenings in the original MACK shop at Brooklyn, N. Y., 27 years ago.

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On heavy duty vehicles, solid tires were used exclusively but they had a habit of tearing loose from their base and cutting many other impromptu capers. The occurrence became so frequent that it was no shock to a driver to suddenly see one of his rubber-covered rims dash ahead in a wild rampage. In many cases two tires were known to leave the wheels of a single vehicle during a ten-mile cruise. These tire hazards, when added to the list of runaway horses caused by the noise of the vehicle, soon conspired to make buses and trucks about as popular as ants in the home sugar bowl.

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One hundred and four direct MACK factory branches operate under the titles of: "MACK INTERNATIONAL MOTOR TRUCK CORPORATION", "MACK MOTOR TRUCK COMPANY", or "MACK TRUCKS OF CANADA, LTD."

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Loading, dumping, spreading and leveling—all are done by this easily handled one-man Tractor Scraper.

*Illustrated circular on request*

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## A New Book of Pumping Experiences to Help You Check Up on Costs

Here's the new  
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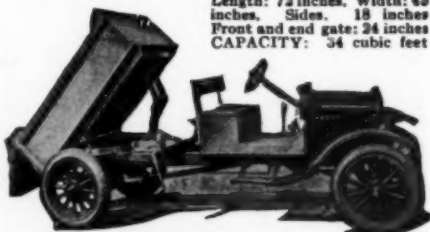
—just off the press. It is packed with pumping experiences of every kind in every corner of the country. And it contains valuable facts and figures that will help you check up on your pumping costs. Send for your free copy today.

NOVO ENGINE COMPANY 216 Porter Street  
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Length: 72 inches. Width: 48 inches. Sides: 18 inches. Front and end gate: 24 inches. CAPACITY: 34 cubic feet



Here it is—the real producer that never balks. It's durable and dependable. Marion bodies can be used with hand hoist or as an automatic type.

This is a most satisfactory Dump Body for handling stone, gravel, sand, dirt, coal and other loose material. Always ready for the hardest kind of service.



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The Marion is the favorite of leading Highway Contractors. It is the dump body of exclusive features.

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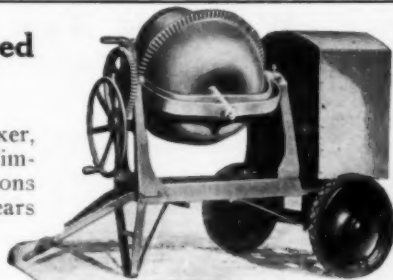


The heart of your mixer is the power unit. Shut-downs are expensive. ALAMO ENGINES are serving others with dependable and efficient power. They can help you. Write us about your power problems.

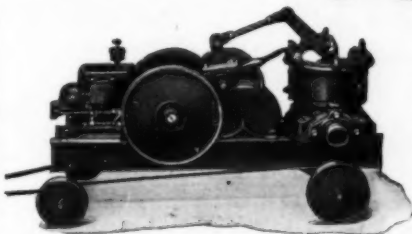
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## The Original Timken-Equipped 3½-Foot Mixer

**T**HE simplicity and strength of this mixer, coupled with our pioneering use of Timken bearings in counter-shaft and drive pinions as well as wheels, are responsible for its years of popularity. Every feature is sensibly engineered and built to last.



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### Diaphragm Units With Fully Enclosed Jack

Compare the compact, rugged, fully enclosed Lauson Jack assembly with the ordinary open gear, rickety construction—there's no comparison from the standpoint of desirability.

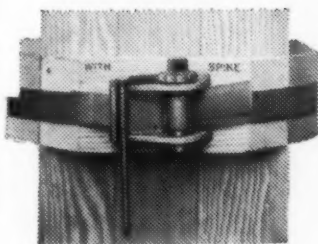
The Jack is driven direct from engine crank-shaft with hardened pinion running in oil, through a single set of machine-cut hardened gears—bearings high-grade bronze—fully enclosed, but leaving belt pulley conveniently accessible for auxiliary work.

Trucks as illustrated or semi-trailer, solid rubber tires on disc wheels—any make of pump desired, or unit with all fittings only, ready for installing pumps you carry in stock.

*We also build Plaster and Mortar Mixers, Contractors Saw Rigs, Gas Engines for all purposes, 2 to 35 H.P. and 35-45 heavy-duty Power Units*

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Clamps that are strong and lasting

Clamps that can be used over and over again

Clamps that are easy to put on and take off

Clamps that fit any shape column

Clamps that store easily when not in use

Clamps that save hundreds of "man hours" on concrete column work (since two men can easily place 60 in one hour)

—are described in the *W. A. K. circular.*  
*Write for your copy*

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T. F. Forchner Contracting Co. are now using 5 Wodacks on Chicago's \$5,000,000 Sewage Disposal Plant. Turner Construction Company are now using 6 Wodacks. Other big users are: McKee Bros., Brown-Harry Co., and Great Lakes Construction Co.



The Wodack is the lightest electric hand saw on the market with 4-inch cutting capacity. Factories buy it to trim boards and crates. Builders trim roofs and cut light 3/4" sheathing—AND most important, the Wodack stands up under heavy work.

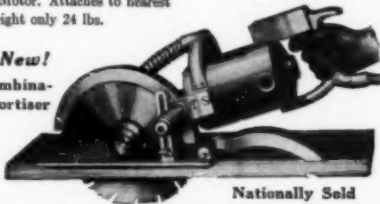
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Special saw dust blower. SAFETY GUARD. 11" and 8" diameter blades. G. E. Universal Motor. Attaches to nearest light socket. Weight only 24 lbs.

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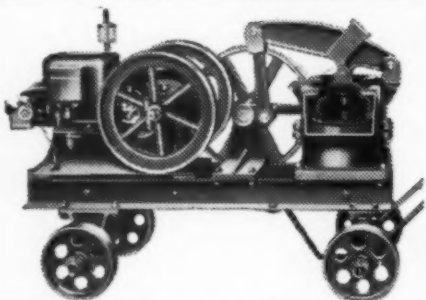
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Also carried  
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For

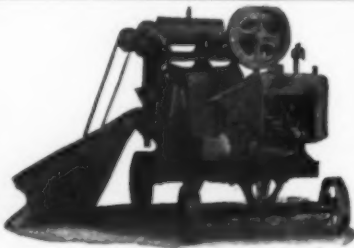
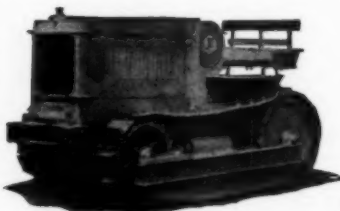
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Ask any JT Operator

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Cleveland, Ohio

40 H. P. Five Ton



## Atlas YARDAGE

120 to 150 cubic yards in 10 hours with an Atlas one-bag Mixer.

Atlas Mixers are of sturdy dependable construction and the 7-S is regularly equipped with multiple-cylinder LeRoi Engine, giving excess power.

We build 3½-foot, ½-bag, 1-bag and 2-bag Mixers.

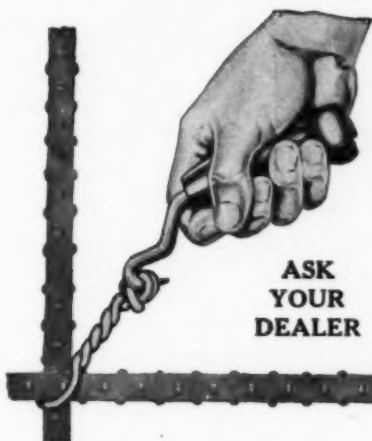
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ASK  
YOUR  
DEALER

Tying Concrete Reinforcing Bars  
with Wire Tie and Tying Tool

## BATES WIRE BAR TIES

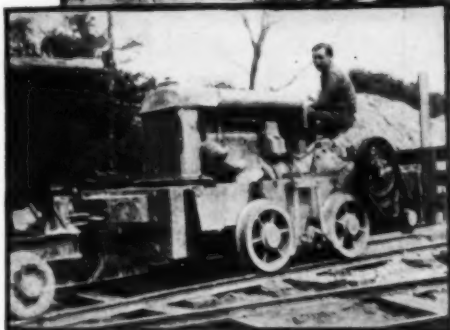
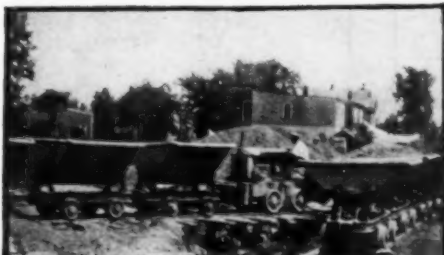
Will save you time, labor and dollars.  
No skilled labor required to use this  
equipment.

Two or three turns with tying tool and  
bars are tied.

Ideal to use in cold weather—men do  
not have to take off their gloves

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2 of the 10 Brookville-Fordson Loco-  
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10 BROOKVILLES  
used by

**THE NECARO CO.**  
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Seven 4-ton "FCR" with  
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one job—a sewer con-  
tract at Jamaica, L. I.

Hauling dirt and supplies and running con-  
crete.

No matter what haulage you use or intend to  
use—if you want efficiency with economy—

*Get the facts from Brookville*

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## Simplex Trench and Sewer Braces

Equipped with the Safety  
Unbreakable 3-Way Nut



The Simplex 3-way nut is safer than the old-style wing nut—more compact and durable—occupies less space and can be used more readily in close quarters.

Can be easily applied to any standard trench brace to replace broken wing nuts.

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**Templeton, Kenly & Co., Ltd.**

Chicago, Illinois

*Mfrs. of the Quality Simplex Lifting Jacks*



**WACKER DRIVE**  
and

## SEALTIGHT

*The Perfected Joint*

Wacker Drive, Chicago's new "double-decked" boulevard, represents an investment of millions of dollars. Such a valuable civic improvement deserves the best possible protection against the destructive forces of nature. That's why Sealtight Expansion Joints were used on this magnificent boulevard.

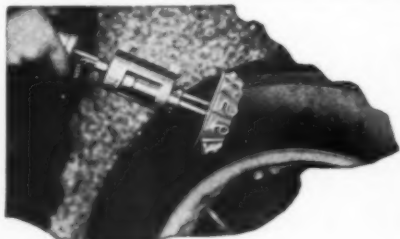
*Make the Road Right—Use "Sealtight"*

**W. R. MEADOWS, Inc.**

Elgin

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## An Invisible "Tire Lock"

Stronger than chains, and more potent than the most powerful mechanical lock—Brand your tires with an Everhot Tire Branding Outfit and you can dispense with all other kinds of so called protection which don't protect.

*Write for full details and prices*

**EVERHOT**  
*America's Brand Makers*  
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**MANUFACTURING CO. MAYWOOD, ILLINOIS**



*"Clings to Metal"*

## A Densified Pennsylvania Oil

**FOR**

Displacing old-fashioned and inefficient cup greases and gear compounds.

## "D-A" Lubricant

is especially adapted for use on heavy duty machinery and is sold by distributors of this type of equipment everywhere.

**D-A LUBRICANT CO., Inc.**

*Plant and Home Office:*

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## — YOU CAN TELL IT'S AN AUSTIN —

### By the Big Roll of Dirt

Telescopic axles and leaning wheels combine to form heavy rear trucks, which, through the exceptional strength of the hot-riveted steel frame, hold the properly curved blade in place. Austin Graders are **"Built to move dirt."**

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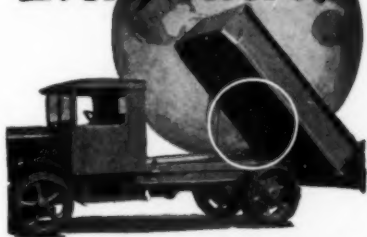
Austin Graders are completely described in our Leaning Wheel Grader Catalog.

If you have had a catalog and lost it, let us send you another, or if we have failed to reach you with one, let us know. You should have it.



**THE AUSTIN-WESTERN ROAD MACHINERY CO.**  
400 North Michigan Avenue Chicago, Illinois

**Everywhere!**



A hoist for every make, model and capacity of motor truck  
Sold and serviced everywhere

The whole story of construction and method of operation is told in our illustrated folder, in colors. Mailed upon request.

**W**HEN you buy Wood Equipment it becomes your property, but ours is the responsibility for satisfactory performance—until the last load is dumped.

**WOOD**  
**HOISTS-BODIES**

**Wood Hydraulic Hoist & Body Company**  
World's Largest Builder of Dumping Equipment  
Detroit, U. S. A.

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Every concrete job can be surfaced and finished better, faster and cheaper with the BERG. One man with a BERG can do the work of four rubbing by hand.

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### The Concrete Surfacing Machinery Co.

Pioneer Manufacturers of Machines  
for all kinds of Concrete Surfacing.  
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Directly Connected BERGS  
(Universal Model) surfacing and  
finishing the base of immense  
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cinnati, O. The Hodges Con-  
struction Co., Cincinnati, Con-  
tractors

## Swift and Sure

Porta Hoist handles all hoisting and pulling jobs with speed and certainty.

It is not just a Fordson with a make-shift hoisting device attached, but a correctly engineered combination of hoist and tractor that will stand up under the stress of severe service.

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Winona, Minn.

Carried in stock, sold and serviced by  
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## PORTA-HOIST

CUTS YOUR COSTS



## DIXON'S GRAPHITE JOINT COMPOUND



Does not "set" or harden. Makes absolutely tight joints. Joints may be easily opened at any time. Saves time, fittings and tools.

Recommended for all threaded or faced joints of steam, water, gas, oil and air piping. It resists heat, cold, acids and alkalis and protects joints from corrosion.

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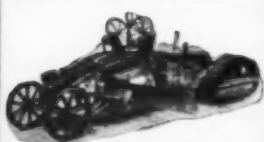
### JOSEPH DIXON CRUCIBLE CO.

Jersey City



New Jersey

1827 — One Hundredth Anniversary — 1927



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Roads are the arteries through which flow the life blood of traffic.

Keep the arteries 100% with H. P. "One Man" Graders. Road quality increased—costs decreased. H. P. Graders scarify, root, grade, ditch, roll and remove snow in winter.

Sturdy, economical, fast and reliable.

Al-wa-tracs crawlerize your tractor and double pulling power.

Al-wa-tracs  
Do It

Ditches  
Scarifies

Roots  
Rolls

W. A. RIDDELL COMPANY

Successors to  
The Hadfield-Penfield Steel Co., Bucyrus, O.



*The*  
**HARDSOCG  
PAVING BREAKER**

Low upkeep cost is the predominating feature of the HARDSOCG Paving Breaker.

Because of the extra long stroke the machine hits exceedingly hard, and thus does a wonderful amount of work in a given time.

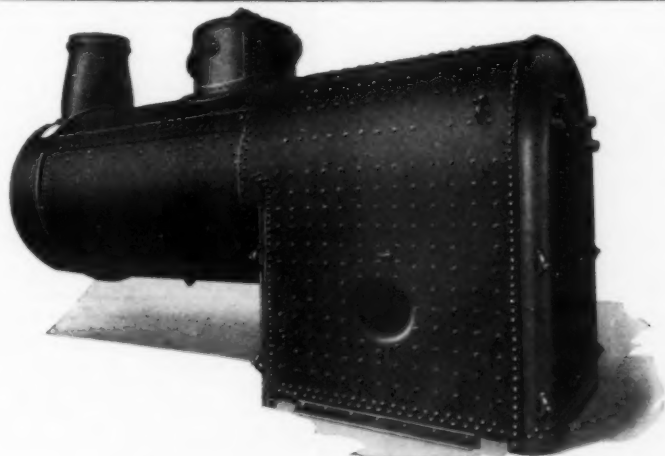
We highly recommend this tool for getting immediate results at the lowest operating expense.

**HARDSOCG WONDER  
DRILL COMPANY**

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*Branch Offices in Principal Cities*



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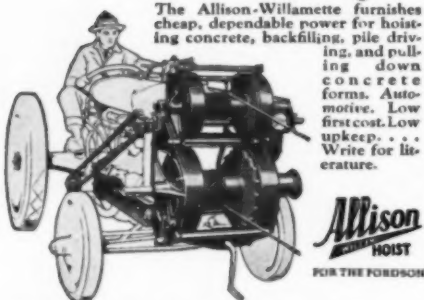
**JOHNSTON BROS., Inc.**

*Specializing in Boilers for Contractors' Equipment*

**FERRYSBURG, MICHIGAN**

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## a great rig ~on concrete construction jobs



The Allison-Willamette furnishes cheap, dependable power for hoisting concrete, backfilling, pile driving, and pulling down concrete forms. Automatic. Low first cost. Low upkeep. . . . Write for literature.

**Allison**  
HOIST  
FOR THE FORDSON

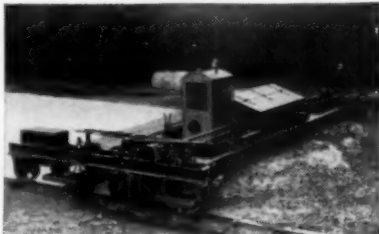
WILLAMETTE IRON & STEEL WORKS, PORTLAND, ORE., U.S.A.  
Dealers Everywhere

# Willamette

## automotive hoists

ALLISON FOR THE FORDSON WILLAMETTE FOR THE CATERPILLAR

## You Can Depend on the ORD —it Sticks to the Job!



Job after job you can depend on the ORD Concrete Road Finisher about as much as you can depend on daylight. The ORD has a well earned reputation for staying with a job until it is completed and still being in fine condition to tackle another—and another.

After years of constant use with a minimum of attention for repairs—the ORD Concrete Road Finisher can be resold for a surprisingly high price.

Truly this is an investment that pays large dividends. Investigate today.

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Manufacturers of the ORD Concrete Road Finisher  
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Both the engineer who desires a sewer pipe having the least frictional resistance to flow and the contractor who desires the pipe that is easiest to lay properly endorse precast reinforced concrete sewer pipe made by the Newark Concrete Pipe Co.

Write us for sketches showing type of joint furnished.

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Showing latest improvements, labor-saving attachments, new models and complete line of **BOSS** Mixers, Drum Mixers, Heavy Duty Mixers, Patents, Hoists for every job. 6-12 by 17,500 lbs.

**BOSS MIXERS LEAD THE WORLD**

**THE AMERICAN CEMENT MACHINE CO., INC.**  
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Branch Offices and Warehouses in All Principal Cities.

**Free Catalog**

Showing latest improvements, labor-saving attachments, new models and complete line of **BOSS** Mixers, Drum Mixers, Heavy Duty Mixers, Patents, Hoists for every job. 6-12 by 17,500 lbs.

**One-Two Bagger**

The Famous Boss 102, A Sanitary Glass Mixer for Any Job.

Mixer one bag any proportion or Two bags 1 2 3 mix. Extreme compact. Weighs No More—Costs No More than some one baggers. BOSS Patented Rapid Discharging and Remitting Action gives 25 to 30 more batches per day. Steel or rubber lined wheels. With Crosshairs Trucks convert into alloy paver. Write for catalog.

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- No. 2 for Fordson tractor for power
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Our catalog of special interest to all road builders—sent free and postpaid

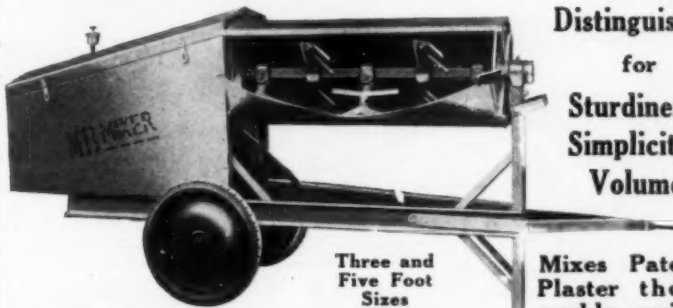
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Factory & General  
Offices:  
Minneapolis, Minn.  
Representatives  
in all  
principal  
cities



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Three and  
Five Foot  
Sizes

The Better Mix Obtained with This Machine  
Facilitates Plastering 15%-20% More Yards Daily

The 3-foot size will keep 5 to 6 plasterers or 10 to 12 masons humping.

The Blades are superior to others in their action—giving a better and more thorough mix. Clutch Control and Tilting Lever are at same end of machine for convenience and safety. Engine highest grade—Alemitte Lubrication of Gears—all well protected.

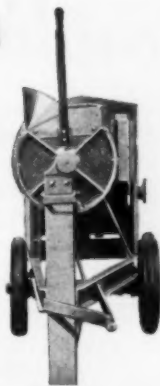
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Distinguished  
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Sturdiness,  
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Mixes Patent  
Plaster thoroughly  
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Easy to Clean

We are equipped to manufacture  
Road Building and Agricultural  
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34 in.  
Outside Width  
Goes through  
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VAN DORN hoist and body units are profit producers because their action is positive and trouble-free because they are built to stand the gaff of hard, continuous service.

Constantly bathed in oil and operating on the worm gear principal the hoist mechanism cannot be surpassed for service. The body itself, while lighter than ordinary truck bodies, has a strength 'ar out of proportion to its weight.

A Van Dorn mechanical hoist plus a Van Dorn body is a combination that means real profits for the operator.

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"More Pay Loads—More Profits"

**Van Dorn**  
MASTERCRAFTSMANSHIP  
IN STEEL



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For Loading  
Crushed Stone,  
Gravel, Sand,  
Coal, etc.



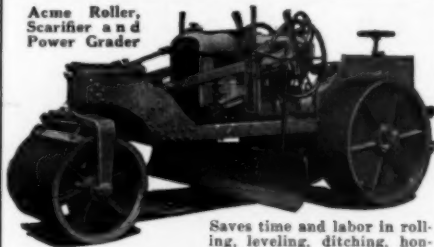
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Every contractor will profit by using these rugged machines to cut the cost of hand shoveling. Ball-bearing rollers for long life! Other advantages, too.

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Geo. Hais Manufacturing Co., Inc.  
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Acme Roller,  
Scarifier and  
Power Grader

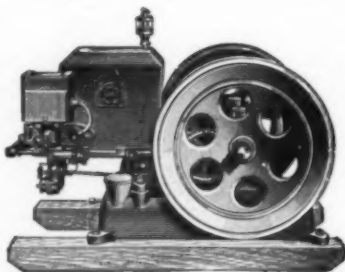


Saves time and labor in rolling, leveling, ditching, honing, or scarifying. Three machines in one. Write for particulars.  
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made in 1½- to 5-cu.yd. size, 3- or 4-inch tires - - immediate shipment  
THE EAGLE WAGON WORKS  
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Reliable Power Plants  
for Industrial Machinery

Contractors agree dependable, economical power is vital to the satisfactory operation of industrial machinery. More and more manufacturers specify Stover engines, because of their proven superiority. The above illustration is of 2 H.P. size. All sizes, Wico Magneto equipped.

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For almost half a century Stover engines have been famous for their in-built quality. Users testify they are better today than ever before. Service stations located everywhere. Write us for FREE literature!

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"Built for service"

ALL STYLES

Portable and Stationary  
25 to 200 gallons

See our page in Street Construction Section  
Municipal Index for the Kettle you need

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DERRICKS, STEEL OR WOOD; WIRE  
ROPE SHEAVES AND BLOCKS;  
WINCHES, HAND AND ELECTRIC

Let us show you our real design of Derrick  
Fittings Backed by an Unusual Guarantee

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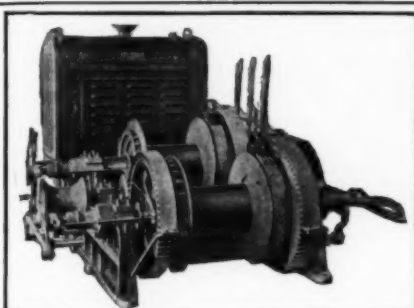


Hundreds of owners are enthusiastic about this big 10- and 12-ton roller with its powerful scarifier and its Climax Trustworthy slow-speed motor.

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### ROAD MACHINERY



## FLORY HOISTS

for  
MISSISSIPPI FLOOD DISTRICT  
RECONSTRUCTION

The new Flory two-speed and other hoists will play a big part in flood reconstruction work because of their ready adaptability to varying conditions, their rapid handling of material, great durability and dependability—plus. These features make all Flory Hoists positively unequaled. Flory is ready for Contractors' demands with ample stocks for quick delivery.

Catalogs or Bulletins on Request. Write or wire.

### S. FLORY MFG. CO.

Bangor, Penna.

Sales Agents in Principal Cities



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### Derricks and Winches

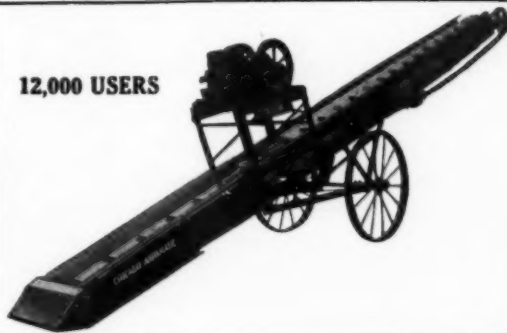
Complete Stock of Fittings and Winches on hand at all times.

Write for our complete Catalog No. 22.

Dobbie Foundry & Machine Company  
Niagara Falls, N. Y.



12,000 USERS



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WITH THE

Non-Clogging Receiving End  
FOR

Every Conveying Purpose

### CHICAGO AUTOMATIC CONVEYOR COMPANY

Originators of the Portable Conveyor  
998 Old Colony Bldg. CHICAGO



**Portable**  
Drives from  
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**Great success**

**Automatically primed**

**Sturdy**  
Large capacity  
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HERE is a ditch pump at surprisingly low cost, yet it does a real job. The Barton attaches to the front of your car (any make), as shown, and your engine drives it. It primes itself automatically—and stays primed. Handles water carrying mud, sand, etc. Write today for Bulletin 56 giving all the facts.

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PORTABLE PUMP

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We manufacture a full line of Tar and Asphalt Heaters, Sand and Gravel Dryers, Oil Burning Heaters, Pouring Pots, etc.



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Send for our little "Blue Book" illustrating our many specials in Tar and Asphalt Heaters—we build just what you want, for road work or general construction.

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—Preferred by Contractors: Road Forms, Street and Sidewalk Forms, Measuring and Weighing Batches, Inundators, Self-cleaning Portable Batch-plant, Steel Bins, Turntables, Clamshell Buckets, Standard Steel Buildings and Calcium Chloride Machines.

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WE HAVE A COMPLETE LINE  
OF DERRICKS AND WINCHES

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## HAND BUSH HAMMERS

A size for every bushing  
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concrete

We would like to acquaint  
you with the most complete  
line of Pneumatic  
tools and chisel equipment  
for bushing concrete and  
finishing cast stone.

Hand Points and Chisels  
Hand and Striking Hammers  
Drill Bits and Hollow Steels



Descriptive matter awaits your call

THE **DALLETT** CO.  
PHILADELPHIA  
NEW YORK CHICAGO

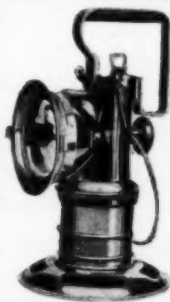
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Use Them in Trains of Two or More



All-steel construction, capacity 3 yardwater level, 4 to 4½ yards rounded. Timken Bearings in wheels provide against end thrust inward and outward. Dust proof hubs, full cut-under fifth wheel. Will turn in its own length. Low loading height of 64½ inches. Brake control. Bumping device allows doors to open any width for spreading load, or load can be dumped instantly. Also furnished in 2½-ton size with steel or rubber tires. Platform body optional on either chassis.

Ask for complete information. The low price will surprise you.

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½-Bag Tilter  
Full 1-Bag 7-S  
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½- to 1-Bag 5-S  
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And the Finest, Fastest Paver Ever Built—the Rex 27-E.

We'll send complete information on the Rex you want to know about—write us.

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You Buy  
**STRENGTH - SERVICE - SAFETY**  
when you purchase  
**ANVIL BRAND BLOCKS**

For  
**MANILA OR WIRE ROPE**

We make all standard styles and sizes and can also supply any special blocks, if you will furnish specifications.

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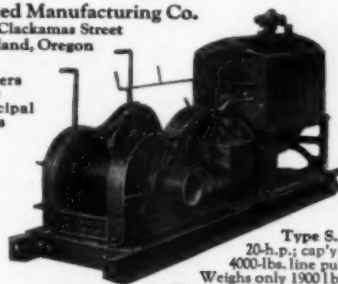
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New York City Chicago

# ERSTED All Steel Automotive 3 SPEED HOISTS

worth more...  
cost less...  
than ordinary hoists!

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Dealers  
in 30  
principal  
cities



Type S.F.  
20-h.p.; cap'y to  
4000-lbs. line pull!  
Weights only 1900 lbs.  
Write for Catalog Today!

1271



# HEIL for Speed

When speed is needed—be sure to specify speedy Heil Hydro Hoists and special L series Heil Bodies for mounting on light-duty trucks. A typical Heil installation on the new GMC model T-50 chassis is illustrated above.

Series L Heil Bodies are 300 to 400 pounds lighter than standard but just as sturdy. You can carry more pay load.

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1242-60 26th Ave. Milwaukee, Wis.

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**HYATT  
Roller Bearing  
Mixers**

**Run Easier  
Last Longer  
Save Fuel**

**Tilting or Drum Type**

A size and type for all purposes:  $\frac{1}{2}$ ,  $\frac{3}{4}$ , Medium and Bag Mixers, Loaders, Tanks, Hoists.

**Prompt Delivery  
from Dealers'  
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Complete stocks carried at all principal cities for quick delivery.

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IRON WORKS**  
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**FOR USE IN—  
GAS, OIL, WATER  
AND DRAIN PIPES**



**SAFETY GAS MAIN STOPPER CO.**

523 Atlantic Avenue  
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**STAR POWER SHOVEL**

with

**Patented Telescoping Handle**

Full Revolving—Full Length Crawler  
Grader—Shovel—Ditcher  
Backfiller—Crane

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Well Drilling Machinery

**The Star Drilling Machine Co.**

Akron, Ohio

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**The new WILLIAMS COLUMN CLAMP**

Solves one of your most aggravating problems in the elimination of PROJECTING CORNERS, when used on columns greater than eighteen inches.

Used on smaller columns the amount of projection is negligible, diminishing gradually until at the eighteen inch column it disappears.

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**WILLIAMS COLUMN CLAMP NATIONAL FORM CLAMP  
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**Clam Shell  
Buckets**

Guaranteed to  
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Benjamin Franklin said:



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1200 Rooms, each with bath  
Rates \$4 upward

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UNDER DIRECTION



OF AMERICA



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Manual Control Solution  
Feed Chlorinator—  
Type MSP

A new rugged apparatus  
in which the Chlorine is  
measured under a  
Vacuum

has become standard practice for the sterilization of water,—the sanitation of swimming pools,—the disinfection of sewage,—the elimination of noxious odors,—and for many other purposes,—largely because of the accuracy and reliability of W & T Chlorine Control Apparatus.

Chlorination of drinking water is not only unsurpassed community health insurance but it is downright good business insurance,—in view of the recent tendency of the Courts\* to award damages to persons stricken with intestinal disease caused by polluted water.

\*See Engineering News Record, Vol. 97, No. 1, p. 30.

*"The only safe water is a sterilized water"*



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Holes in Street Before Patching

### LITTLEFORD PORTABLE OIL BURNERS

Used for supplying heat for tar and asphalt melting kettles, thawing and drying holes in roads before patching, thawing frozen piles of sand, gravel, coke, coal, stone, etc., heating mortar boxes in cold weather, drying concrete for waterproofing, heating concrete in mixers. Two types—circular and torch. Many other uses.

Write for Bulletin C-6, which gives full details

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400 Rooms with Baths

\$3<sup>00</sup> and up for One Person

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**HOTEL  
KNICKERBOCKER  
NEW YORK**

WEST 45<sup>TH</sup> STREET

Just East of Broadway

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Heart of

Theatrical and Shopping District

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Contractors' & Engineers' Monthly,

443 Fourth Avenue, New York City.

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Name .....

Address .....

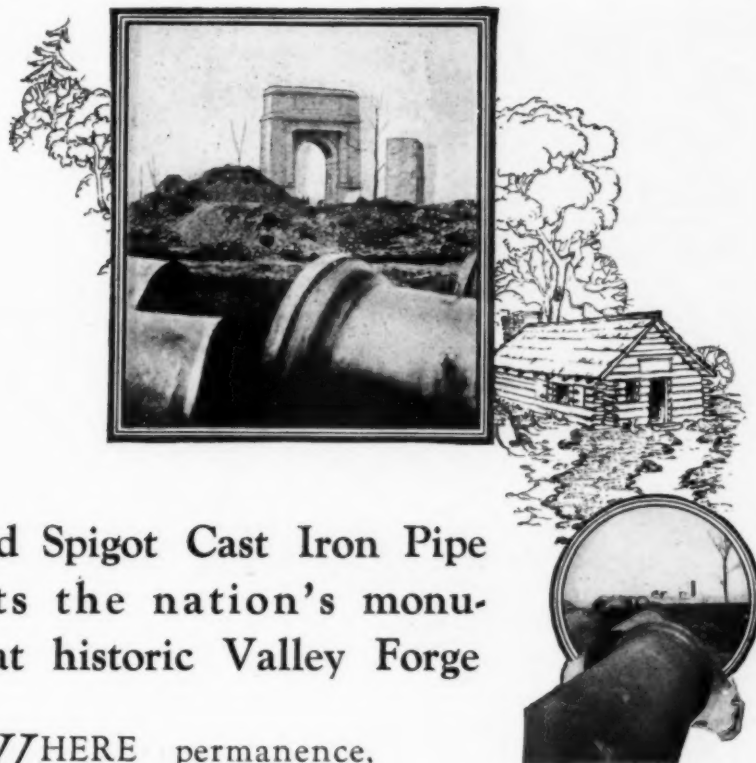
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Name .....

Street .....

City and State .....

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WHERE permanence,  
safety and lower main-  
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iron pipe is specified and used.

*Write for new illustrated hand-  
book which contains full specifica-  
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construction engineers.*



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Birmingham Pittsburgh  
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1 1/4-Yard  
3/4-Yard  
Tractor  
Models

## BAKER MANEY

### Self Loading Scrapers

The Baker Manufacturing Co.  
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AIR COMPRESSORS

A variety of types and sizes to meet every portable compressor demand—Sold through reliable dealers and distributors.



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BUHL type "Y" furnished in 115 and 180 ft. displacement

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*Are Always Reliable*

Made for  
Every Condition of Service

Sold by  
Leading Supply Houses

OR  
**BOSTON & LOCKPORT BLOCK CO.**  
NEW YORK EAST BOSTON CHICAGO



24-16-12 inch,—BELT CONVEYORS

any length up to 100 feet  
mounted on truck or furnished for suspension  
Builders of the NORTHERN STAR  
CEMENT BAG CLEANER AND  
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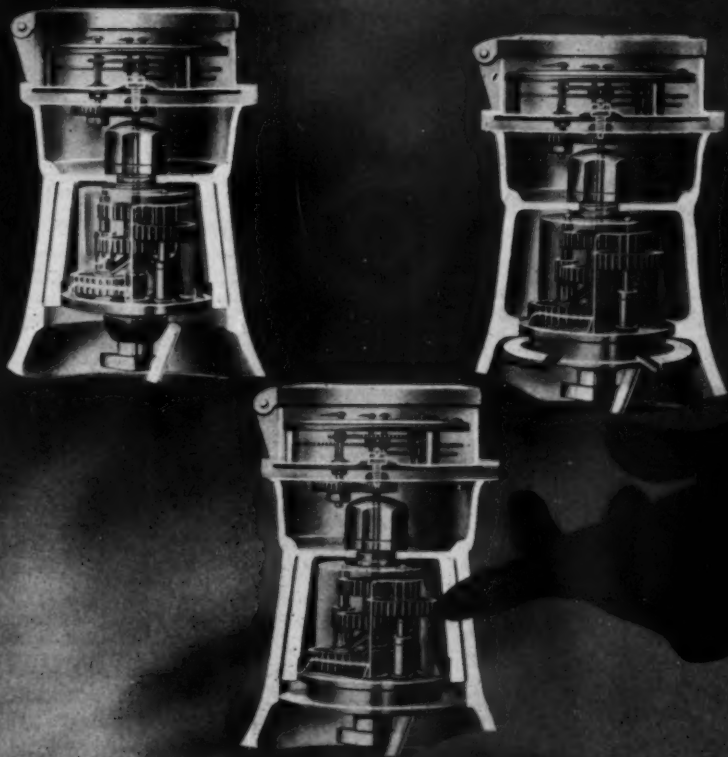
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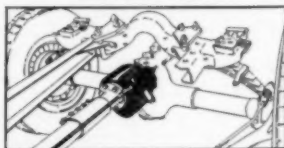
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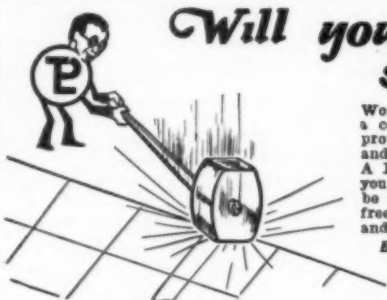
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**WORLDBERG**—Trackshifters & Shovelloaders  
**NORTHWEST**—Cranes, Draglines & Shovels  
**SHAW-ENOCHS**—"SHAWNEE" Power Graders  
**UNIVERSAL**—Truck Cranes

**The Young & Vann Supply Co.**  
Birmingham, Ala.

Complete line of Contractors' Equipment and Supplies.

*REPRESENTING*  
**Smith Concrete Mixers and Pavers**  
**Novo Hoists, Pumps, etc.**  
**Blaw-Knox Steel Forms, Batch Plants, Cram Shell Buckets**  
**Worthington Pumps and Air Compressors**  
**Thew Gas, Steam and Electric Shovels**  
**Baker Backfillers and Unloaders**  
**Archer Concrete Towers**  
**Rex-Watson Dump Wagons**  
**Red Edge Shovels and Picks**  
**General Wheelbarrows**  
**Carey Elastite Expansion Joint**  
**M. & M. Form Clamps**

**LAWRENCE-GOODLING CO., Inc.**  
161-165 N. Water St. Mobile, Ala.

*Representing*  
**Gallon Iron Wks. & Mfg. Co.**—Road Machines, Road Rollers, etc.  
**A. B. Farquhar Co., Ltd.**—Saw Mills, Boilers and Engines  
**Sidney Steel Scraper Co.**—Wheelers, Drag Scrapers, Road Plows, etc.  
**Gordon Hollow Blast Grate Co.**—Edgers and Trimmers  
**Henry Disston & Sons**—Saws  
**Oliver Ames Corporation**—Shovels  
**Ransome**—Concrete Mixers

If you are located in Western Florida, Southern Mississippi or Alabama let us serve you.

## ALA.—ARIZ.—ARK.—CALIF.

**TURNER SUPPLY COMPANY**

N. W. Corner St. Louis & Commerce Sts.  
**MOBILE** *Representing: ALABAMA*  
**McKIERNAN-TERRY DRILL CO.**—Pile Hammers  
**INDEPENDENT PNEUMATIC TOOL CO.**—"Thor" Tools and Compressors  
**G. H. WILLIAMS CO.**—Clamshell & Dragline Buckets  
**ARCHER IRON WORKS**—Concrete Chuting Equipment  
**DOMESTIC ENGINE & PUMP CO.**—Pumps and Hoists  
**DOBIE FOUNDRY & MACHINE CO.**—Derricks  
**ORR & SEMBOWER**—Concrete Mixers & Hoists  
**AMERICAN STEEL & WIRE CO.**—"Monitor" Wire Rope  
**LANSING COMPANY**—Barrows and Trucks  
**AMERICAN ROLLING MILLS CO.**—Genuine Armo Ingot Iron  
**WYOMING SHOVEL CO.**—"Red Edge" Shovels & Scoops  
**LINK BELT COMPANY**—Crawler Cranes, Shovels & "Grizzly" Loaders  
**WESTERN WHEEL SCRAPER CO.**—Wheelers, Drags, Tumblebugs, Fresnoes, Scrapers, and Ploughs  
**BATES MFG. COMPANY**—Bar Ties

**Arizona Tractor & Equipment Co.**  
238 W. Jefferson St., Phoenix, Arizona*Distributors for:*

<b>J. D. Adams &amp; Co.</b>	<b>Insley Mfg. Co.</b>
<b>Buffalo-Springfield Roller Co.</b>	<b>Killefer Mfg. Co.</b>
<b>Caterpillar Tractor Co.</b>	<b>La Plant-Cheate Mfg. Co.</b>
<b>Harnischfeger Corp.</b>	<b>Littleford Brothers</b>
<b>Blaw-Knox Co.</b>	<b>Page Engineering Co.</b>
<b>The Kell Co.—Hoists</b>	<b>T. L. Smith Co.</b>

**JOE LYONS MACHINERY CO.***Contractors' Equipment and Supplies*

112 Louisiana St. Little Rock, Ark.

*Representing:*

**REX**—Mixers and Pavers  
**OLYDE**—**SASGEN**—Derricks and Hoists  
**BLAW-KNOX**—Curb, Gutter and Road Forms, Bins, Batchers, Clamshell Buckets, Truck Turntables  
**RED STAR**—Wheelbarrows and Concrete Carts  
**RED EDGE**—Shovels and Picks  
**C. H. & E.**—Pumps, Saw Rigs and Hoists  
**NORTHWEST**—Shovels, Cranes and Draglines  
**AMERICAN**—Wire Rope  
**CLIMAX**—**LEROI**—**FULLER & JOHNSON**—Engines  
**OIL PULL**—Road Tractors  
**BATES**—Bar Ties.  
 Also anything else a contractor uses

**The BROWN-BEVIS CO., Inc.**  
470 East Third St., Los Angeles, Cal.*DISTRIBUTORS*

**T. L. Smith Co.**—Concrete Mixers, Pavers and Excavators  
**J. D. Adams and Co.**—Adams Leaning Wheel Graders  
**Sullivan Machy. Co.**—Compressors, Hoists  
**Wood Shovel & Tool Co.**—Wood Molybdenum Shovels  
**Lakewood Engineering Co.**—Concrete Placing Machinery and Road Finishers  
**Geo. Hais Mfg. Co.**—Truckloaders and Conveyors  
**Barnes Mfg. Co.**—Barrow Pumps  
**The Owen Bucket Co.**—Clam Shell Buckets  
**The Buckeye Traction Ditcher Co.**—Curb and Trench Ditchers  
**Rex-Watson Corp.**—Dump Wagons  
**Universal Crusher Co.**—Crushers  
**Traylor Engineering & Mfg. Co.**—Rock Crushing Equipment  
**Monarch Tractor Co.**—Tractors  
**Four Wheel Drive Auto Co.**  
**Littleford Bros.**—Tar and Asphalt Heaters, etc.  
 Member: Associated Equipment Distributors

Do you mention the CONTRACTORS AND ENGINEERS MONTHLY when writing? Please do.

## CALIFORNIA

**COAST MACHINERY CORPORATION**

464 East Third St., Los Angeles, Calif.  
829 Folsom Street, San Francisco, Calif.

*Representing:*

T. L. SMITH COMPANY—Concrete Mixers & Pavers (S. F. Territory)  
CLIMAX ENGR. CO.—Industrial Gas Engines  
CURTIS PNEUMATIC MACHINERY CO.—Compressors, Hoists, Trolleys  
CUSHMAN MOTOR WORKS—Gas Engines  
UNIVERSAL MOTOR CO.—Gas Engines  
CONCRETE SURFACING MACHY. CO.—Concrete Surfacers and Finishers. (I. A. Territory)  
DEMING PUMP COMPANY—Pumps  
HUMPHRIES MFG. CO.—Power Pumps  
RALPH B. CARTER CO.—Diaphragm Pumps

## CALIFORNIA

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1928 Santa Fe Ave.,  
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*Representing*

NOVO ENGINE COMPANY  
LAKEWOOD ENGINEERING CO.  
C. D. EDWARDS MFG. CO.  
STANDARD STEEL WORKS  
PEERLESS MACHINERY CO.  
IDEAL CONCRETE MACHY. CO.

**COLLINS-KAY MACHINERY CO.**

438 East 3rd St. Los Angeles, Calif.

*Representing*

BAY CITY FDY. & MACHINE WKS.—Gasoline Truck Cranes  
ERIE STEEL CONSTRUCTION CO.—Clamshell Buckets and Aggregators  
FATE-ROOT-HEATH CO.—Gasoline Locomotives  
THOMAS ELEVATOR CO.—Electric and Gasoline Hoists  
NORTHWEST ENGR. CO.—Gasoline & Pull Diesel Shovels, Draglines and Cranes  
NORTHERN ENGR. CO.—Electric Traveling Cranes  
ALLOY STEEL CO.—Roller Bearing Jaw Crushers—All Sizes  
BUHL CO.—Portable Air Compressors and Hoists

**GARLINGHOUSE BROS.**

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*Southern California Distributors For:*

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Dobbie Fdy. & Mach. Co., Derricks  
Insley Mfg. Co.—Concrete Placing Equipment, Excavators  
Lidgerwood Mfg. Co.—Hoists, Cableways  
Smith Engineering Wks.—Crushers and Gravel Plant Equipment  
The Knickerbocker Company—Concrete Mixers and Saw Rigs  
A. Leech & Sons Rope Co.—Wire Rope  
McKiernan-Terry Drill Co.—Pile Hammers  
Atlas Engineering Co.—Conveyors  
Telephone, AXridge 1234

**Concrete Machinery & Supply Co.**

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*Construction and Industrial Equipment*

Bex Pavers  
Butler Bias and Batchers  
Williams Buckets  
Bex Concrete Mixers  
National Hoists  
Archer Hoist Tower & Spouting  
Elystone Plaster and Mortar Mixers  
Concrete Pipe Forms  
Orton Cranes & Shovels  
Continental Engines  
National Pile Hammers  
Le Roi Engines  
Red Star Wheelbarrows and Carts  
Connant Shovels  
Domestic Pumps

Member: Associated Equipment Distributors

**LEIGH M. RAILSBACK**

115 So. Angeles St., Los Angeles, Cal.

*Representing*

GALION Road Machinery, Rollers, Graders, etc.  
LEACH Concrete Machinery  
RELIANCE Crushers and Sweepers  
ANDRESSEN Road Repair Outfits  
BAY CITY Shovels and Cranes  
McCORMICK-DEERING Industrial Tractors  
GRECO Pavement Heaters  
MONARCH Loaders  
JOLIET Hoists  
NATIONAL Traffic Markers

**Construction Machinery Co.  
of California**

455 E. 3d St. Los Angeles, Calif.

American Saw Mill Machinery Company  
Sageen Derrick Company  
Construction Machinery Co., Waterloo, Iowa  
Sidney Steel Scraper Co., Barrows only  
Indiana Rolling Mills Shovels  
Creson Morris Company  
Silver Manufacturing Company  
Associated M't'rs. Gas Engines  
Norris K. Davis Company

**SHEPHERD-CROOK, Inc.**

514 West 12th St. Los Angeles, Calif.

*Representing*

CATERPILLAR Tractors  
RUSSELL Graders  
KILLEFER Road Tools  
OSGOOD Cranes, Shovels and Drag Lines  
BAKER MANEY Scrapers  
LaPLANT-CHOATE Wagons

## DISTRIBUTORS OF CONTRACTORS' EQUIPMENT

## CALIFORNIA

## SMITH BOOTH USHER CO.

Los Angeles  
228-238 Central Avenue

San Francisco  
50 Fremont Street

## Distributors for:

Archer Iron Works	Hercules Motors Corp.
Barber-Greene Co.	Heitzel St. Pm. & Ir. Co.
Burch Plow Works	The Jaeger Machine Co.
The Buhl Co.	C. S. Johnson Co.
The Byers Machine Co.	Morris Machine Works
Carr Sub-Grader Mfg. Co.	Nelson Brothers Co.
Clyde Iron Works	Page Engineering Co.
Easton Car & Constr. Co.	Sauerman Brothers, Inc.
The Foote Co.	Thew Shovel Co.
Freeman Mfg. Co.	Geo. D. Whitcomb Co.
A. W. French & Co.	Ward Plow Co.
Goulds Pumps, Inc.	Geo. D. Roper Corp.

## R. T. McCLELLAND

4030 Hollis Street  
Oakland, Calif.

## Representing

Ransome Concrete Machinery Co.  
Mixers, Pavers, Towers, Spouting  
Novo Engine Co.  
Engines, Hoists, Pumps, Compressors  
Blaw-Knox Co.  
Steel Forms, Clamshell Buckets, Batcher Plants  
National Hoisting Engine Co.  
Steam Pile Hammers  
Steam Hoists

## EDWARD R. BACON COMPANY



Folsom at 17th Street

San Francisco

## Representing

ACME Gasoline Rollers	MEAD-MORRISON Grab
ADAMS' Leaning Wheel Graders	Buckets and Hoists
ORD Concrete Road Finishers	LAKEWOOD Chuting Plants
BARNES Road Pumps	CEDAR RAPIDS Crushing Out-
BURCH Stone Spreaders	fits
HERCULES Power Units	WHITCOMB Locomotives
JOHNSON Batch Hoppers	McKIERNAN-TERRY Pile
JAEGER Concrete Mixers	Hammers
MULTIFOOTE Road Pavers	FREEMAN Turntables
MADSEN Asphalt Plants	CARR Subgraders
GENERAL Gas Shovels, Cranes	EASTON Industrial Cars
and Ditchers	OSGOOD Shovels—Steam and
	Gas

## NORRIS K. DAVIS

400 Seventh St. San Francisco, Calif.

## Representing

CONSTRUCTION MACHY. CO.—"Wonder"  
Mixers, Hoists, Pumps, etc.  
LE ROI—Engines  
MINNEAPOLIS STL. & MACHY. CO.—Twin  
City Engines  
W. S. MEADOWS—Seal Tight Expansion Joints  
ARCHER IRON WORKS—Concrete Placing  
Equipment  
METAL FORMS CORP.—Forms for Conc. Con-  
struction  
CLEVELAND WHEELBARROW CO.—Wheel-  
barrows  
G. H. WILLIAMS CO.—Clamshell Buckets  
Mixers, Concrete and Mortar Gas or Electric  
Hoists

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## ENGINEERING PRODUCTS CO.

RIALTO BUILDING SAN FRANCISCO

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SEATTLE FROG & SWITCH COMPANY

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CONTRACTORS  
CARS AND TRACK

RAIL — FROGS — SWITCHES  
TRACK MATERIALS

## GARFIELD &amp; CO.

Hearst Bldg. San Francisco, Calif.

## Representing

Erie Steam Shovel Co.	Plymouth Locomotive
Insley Mfg. Co.	Works
J. S. Mundy Hoisting	Thomas Elevator Co.
Eng. Co.	Erie Steel Constr. Co.
The Parsons Company	Page Engrg. Co.
Leach Company—Concrete Mixers	

## HARRON, RICKARD &amp; McCONE CO.

139 Townsend St. 2205 Santa Fe Ave.  
San Francisco, Calif. Los Angeles, Calif.

## REPRESENTING

American—Hoists & Derrick	Koching — Shovels, Cranes
Bouch—Portable Saws	Draglines, Pavers, Mixers
Becke—Hand Hoists	LaBel—Power Unit
Blaw-Knox — Buckets, Steel	Littleford—Asphalt Equipment
Forms, Bins	Parker—Portable Woodworking
C. H. & E.—Hoists, Pumps,	Machinery
Saws, Mixers	Simplicity — Super Vibrating
Handy—Rock Cleaners, Balers	Screens
Ingersoll-Rand — Compressor	Starling—Wheelbarrows & Carts
& Drills	Vulcan—Locomotives
Keystone—Power Shovels	Vulcan-Warrington—Pile Driv-
Kwik-Mix—Mixers	ing Hammers

## THE STUART S. SMITH CO.

19th & Indiana Sts., San Francisco, Cal.

## Representing

Boyer Fire Apparatus Co.  
Chausse Oil Burner Co.  
Elgin Street Sweeper Co.  
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Lakewood Engineering Co.  
Northern Conveyor & Mfg. Co.  
Orton Crane & Shovel Co.  
Chas. T. Topping Machinery Co.



# DISTRIBUTORS OF CONTRACTORS' EQUIPMENT

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## CALIF.—COLO.

### CORNELL TRACTOR CO.

227 The Alameda,  
San Jose, Calif.

363 Main St.  
Salinas, Calif.

#### Distributors

Caterpillar  
Killefer  
Killefer  
Russell  
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Tractors  
Road Machinery  
Farm Machinery  
Road Machinery  
Tractor Lubricant

### THE BURNITE MACHY. CO., Inc.

518 BOSTON BLDG.

DENVER, COLO.

#### Representing

T. L. Smith Company, Concrete Mixers and Pavers  
Smith Engineering Works, Crushers and Screening Plants  
Parsons Co., Trench Excavators and Backfillers  
Union Iron Works, Pile Drivers and Grout Mixers  
Mead-Morrison Co., Hoists and Tractors  
Orton Crane & Shovel Co., Locomotive, Truck Cranes, etc.  
Geo. Hales Mfg. Co., Truck Loaders and Conveyors  
Archer Iron Works, Concrete Chuting Equipment  
Barnes Mfg. Co., Portable Pumps and Compressors  
Northwest Engr. Co., Crawler Cranes, Shovels and Draglines  
Elgin Sales Corp., Elgin Pickup Street Sweepers  
Leach Company, Portable Saw Rigs  
Erie City Iron Works, Boilers, Engines, Coal Pulverizers  
Wheeler Condenser & Engr. Co., Condensers and Cooling Towers  
The Permutit Co., Water Softeners and Filters  
The Roto Co., Turbine Tube Cleaners  
Chicago Automatic Conveyor Co., Portable Conveyors

### CLINTON AND HELD CO.

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#### Distributors

Caterpillar Tractors  
Stockland Road Mach. Co.—Graders and Fresnoes  
Killefer Mfg. Co.—Road Scarifiers and Scrapers  
LaPlant-Choate Mfg. Co.—Tractor Trailers—  
Snow Plows—Hydraulic Scrapers  
Baker Mfg. Co.—Snow Plows and Scrapers  
Union Iron Works—Sargent Snow Plows  
Illinois Wire & Mfg. Co.—Big Red Snow Fence  
D-A Lubricant Co.—Tractor Lubricants  
Athy Truss Wheel Co.—Truss Wheel Assemblies  
Wiard Plow Co.—Steel Beam Road Plows  
Clinton Flat Bottom Ditchers  
Ransome Concrete Mach. Co.—Mixers

### JOHN W. FINK COMPANY

1529 16th St.

Denver, Colo.

#### Representing

ROME MFG. CO.—Graders  
DUPLEX MFG. CO.—Road Maintainers  
SPEEDER MACHY. CO.—Gas  
Shovels, Cranes, Draglines, Skimmers  
HUBER MFG. CO.—Gas Rollers  
DAVIS MFG. CO.—Land Levelers

## COLORADO

*Paul H. General*  
INDUSTRIAL & CONSTRUCTION

#### EQUIPMENT

INTERNATIONAL BANK BLDG.  
DENVER, COLO.

P & H. Shovels, Cranes,  
Draglines, Trench Machines  
Northern Portable and Stationary Conveyors  
Plymouth Gasoline Locomotives  
Archer Steel Tower and Concrete Distributing Systems  
Owen Clamshell Buckets

Ohio Locomotive Cranes  
Erie Aggreometer Plants  
McKernan-Terry File Hammer  
Grummett Crushing and Screening Plants  
Highway 3-4-6-8 Wheel Trailers  
Page Dragline Buckets

### LINDROOTH, SHUBART & CO.

521 Boston Bldg., Denver, Colo.

#### Representing

##### LINK-BELT CO.

Portable Loaders  
Cranes  
Draglines  
Shovels  
Belt Conveyors  
Elevators  
Sand and Gravel Plants

##### INSLEY MFG. CO.

Ditchers  
Cranes  
Draglines  
Shovels  
Mast Hoists  
Concrete Placing Equipment

### H. W. Moore Equipment Company

#### Construction Machinery

#### Fordson Power Equipment

#### Earth Handling and Road Building Machinery

Sixth and Acoma Streets, Denver, Colorado

Gallon Iron Wks. & Mfg. Co.  
Lakewood Engineering Co.  
Jaeger Machine Co.  
Bay City Dredge Works  
Marion Steam Shovel Co.  
Barnes Manufacturing Co.  
Geo. D. Whitcomb Co.  
Hercules Motors Corp.

The Mundle Manufacturing Co.  
Ward Plow Co.  
Saugen Derrick Co.  
Holtzel Steel Form & Iron Co.  
Iowa Manufacturing Co.  
National Hoisting Engine Co.  
Universal Crane Co.  
Ersted Machinery Co.

Member of Associated Equipment Distributors

### THE HERBERT N. STEINBARGER CO.

#### CONSTRUCTION EQUIPMENT

1640-1646 Wazee St.,

Denver, Colo.

#### DISTRIBUTORS

Bucyrus Steam, Gas and Electric Shovels and Draglines  
Vulcan Steam and Gasoline Locomotives  
Clyde Hoists and Derricks  
Russell Graders, Scrapers, Gravel Handling Equipment  
Sawyer Power Scrapers, Cideway Ramrakers  
Butler Bins and Hoppers  
Metal Form Sidelwalk, Curb and Road Forms  
New Concrete Pavers, Building Mixers  
Williams Buckets  
Brystone Plaster and Mortar Mixers  
Symons Column Clamps, Adjustable Shores  
Buffalo-Springfield Steam and Gasoline Rollers  
Elevators Constrictors and Pressure Pumps  
Curtis Portable Compressors  
Harding Drills and Pavement Breakers  
Member: Associated Equipment Distributors



## DISTRIBUTORS OF CONTRACTORS' EQUIPMENT

## COLO.—CONN.—CUBA

**WILSON MACHINERY COMPANY**

Construction Machinery

1936 Market St. Denver, Colorado

## Representing

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Austin - Western Road Machinery Co.	Heisl Company
Barber-Greene Co.	Heisl Locomotive Co.
Blaw-Knox Co.	Koehring Co.
Buckeye Traction	Marshall-Wells Co.
Ditcher Co.	Monarch Tractors Corp.
Byers Machine Co.	Mundy Hoist Eng. Co.
G. H. & E. Mfg. Co.	Waukesha Motor Co.
Cleveland Wheelbarrow Company	Western Wheeled Scraper Company

## FLORIDA

**McDONALD & BURGMAN**8 Riverside Viaduct Jacksonville, Fla.  
West Palm Beach, Miami

## Distributors of Dependable Machinery

"Caterpillar" Tractors  
Austin Western Road Machinery  
Erie Gas-Air and Steam Shovels  
Universal Cranes  
Williams Clamshell Buckets  
La Plant-Cheate Tractor Trailers & Bulldozers  
Bonney Loaders  
D-A Lubricant for Tractors

If it's dirt moving equipment you need, we can furnish it from stock

Member: Associated Equipment Distributors

**The H. B. NOBLE CO.**

## REPRESENTING AMONG OTHERS

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RUSSELL: Graders  
EASTON: Industrial Equipment  
LEIGH: Power Units  
"ATLAS": Mortar & Plaster Mixers  
NATIONAL: Hoists  
OWEN: Clamshell Buckets  
PULSOMETER: Steam Pumps  
"REX": Mixers, Pavers  
BARGEN: Derricks  
JONES: Super Woodworkers  
SULLIVAN: Compressors, Drills  
UNIVERSAL: Crushers, Bins, Etc.  
HUMPHRIES: Pumps  
"20th CENTURY" Woodworkers  
"HERCULES": Engines

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Member: Associated Equipment Distributors.

HARTFORD, CONNECTICUT

**M. D. MOODY**

Office: 402 Masonic Temple Warehouse: No. 2 A. C. L. Yards

Jacksonville, Florida

## Representing

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American Casting Company	Chas. Hyatt & Company
American Tar Products Co.	Littleford Brothers
Buffalo-Springfield Roller Co.	Lakewood Engineering Co.
Cyclone Fence Company	Mead-Morrison Mfg. Co.
Elgin Sales Corporation	Rawls Mfg. Company
E. D. Ebyre & Company	Rex Watson Corporation
Erie Steel Company	Telsmith Engineering Co.
E. W. C. Crawler Type Tractors	

**HAVANA FRUIT COMPANY**

Habana

Cuba

## Representing

Caterpillar Tractor Co.	Mundy Hoisting Engine Co.
Russell Grader Mfg. Co.	Erie Steel Construction Co.
Barber-Greene Co.	Atlas Engineering Co.
Chain Belt Co.	Harnischfeger Corp.
D-A Lubricant Co.	Universal Road Machinery Co.
La Plant-Cheate Mfg. Co.	Littleford Brothers
The Martin Wagon Co.	Chas. Hyatt & Co.
The Barnes Mfg. Co.	Adams Manufacturing Co.
The Klien Mfg. Co.	Sterling Wheelbarrow Co.
Little Red Wagon Mfg. Co.	The Huber Manufacturing Co.
Lakewood Engineering Co.	Fox Brothers & Co., Inc.
Aeroll Burner Company	Four Wheel Drive Auto Co.
	Easton Car & Construction Co.

Member: Associated Equipment Distributors

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Room 1322, Barnett Natl. Bank Bldg.

JACKSONVILLE, FLA.

## REPRESENTING:

VENN-SEVERIN MACHINE CO.—Semi-Diesel Oil Engines  
DOMESTIC ENG. & PUMP CO.—Pumps, Hoists  
PENNSYLVANIA CRUSHER CO.—Steel Roll Rock Crushers  
F. E. MYERS & SONS.—Bulldozer Pumps  
INGERSOLL-RAND, INC.—Compressors and Rock Drilling Equipment  
WESTINGHOUSE ELECTRIC & MFG. CO.—Generators and Motors  
RANSOME CONCRETE MIXERS  
ELECTRIC LIGHT, WATER and ION PLANT INSTALLATION

LARGE STOCKS CARRIED IN JACKSONVILLE

**J. Z. HORTER COMPANY**Obispo and Oficios Streets  
HAVANA, CUBA

## Representing

T. L. Smith Company  
Stockland Road Machinery Company  
National Hoisting Engine Company  
Monarch Tractors, Inc.  
Twin City Tractors

**CONTRACTORS EQUIPMENT CO.**

Miami, West Palm Beach, Daytona, Jacksonville, Florida

## Representing

Ingersoll-Rand Compressors and Tools	Barnes Power Pumps
Rex Pavers and Mixers	Ord Conc. Bd. Finishers
Essick Plaster Mixers	Street Bros. Hoists and Slacklines
Butler Bins and Batches	Hasard Wire Rope
Hotchkiss Steel Forms	Reeshers
Lansing Barrows and Carts	Jones Superior Saw Rigs
	LeRoi Engines
	Syntrom Hammers
	Goodyear Belt and Hose

Do you mention the CONTRACTORS AND ENGINEERS MONTHLY when writing? Please do.

# DISTRIBUTORS OF CONTRACTORS' EQUIPMENT

161

## FLORIDA

### L. D. LLEWELLYN, INC. MIAMI FLORIDA

#### REPRESENTING:

American Mfg. Co.	Hercules Corp.
American Saw Mill Machy. Co.	Independent Pneumatic Tool Co.
American Steel & Wire Co.	Jaeger Machine Co.
Anchor Concrete Mach. Co.	Jackson Mfg. Co.
Anchor Iron Works	Jeffrey Mfg. Co.
Austlin-Western Rd. Mach. Co.	Wm. H. Keller, Inc.
Barber-Greene Co.	Mathews Conveyor Co.
Blystone Mfg. Co.	Metal Forms Corp.
Chicago Pneumatic Tool Co.	Page Engineering Co.
Cleveland Wheelbarrow & Mfg. Co.	Northwest Eng. Co.
Denver Rock Drill Mfg. Co.	Nova Engine Co.
Electric Welding Co.	Rochester Can Co.
Erle Steel Const. Co.	Saegon Derrick Co.
Fairbanks, Morse & Co.	Schramm, Inc.

Member: Associated Equipment Distributors

### I. E. SCHILLING COMPANY

125 N. E. 6th St.

Miami, Fla.

#### Representing

Owen Bucket Co.	Miles Mfg. Co.
Ideal Conc. Machy. Co.	Mac Whyte Co.
Sasgen Derrick Co.	Le Roi Engine Co.
T. L. Smith Co.	Construction Mch. Co.
Clyde Iron Works	Ryan Mfg. Corp.
Sterling Whlbrw. Co.	Wyoming Shovel Wks.
Beach Mfg. Co.	General Electric Co.

Domestic Engine & Pump Co.

### D. E. FISHBACK

ORLANDO

FLORIDA

#### DISTRIBUTOR

Fairbanks-Morse & Co., Oil Engines, Pumping Machinery, Electric Motors, Home Light and Water Plants.

The Jaeger Machine Co., Concrete Mixers for every purpose.

Cincinnati Rubber Co., Dredging Sleeves, Suction and Discharge Hose.

O. K. Clutch & Mach. Co., Hoisting Machinery.

American Saw Mill Mach. Co., Portable Woodworkers, Saw Benches, Etc.

Gonick's Pumps, Inc., Power, Diaphragm and Hand Pumps.

Cement Block Mach. Co., "National" Concrete Block Machines.

Chicago Pneumatic Tool Co., Portable and Stationary Air Compressors, Air Lift Pumps, Etc.

Pine Valves and Fittings.

STOCK CARRIED IN ORLANDO

### BURRESS-CLARK MACHINERY CO.

Tampa, Florida

#### EXCLUSIVE DISTRIBUTORS FOR:

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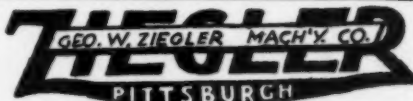
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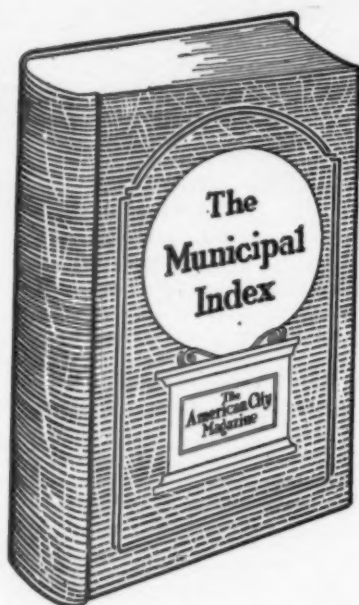
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## INDEX TO ADVERTISERS IN THIS ISSUE

This index is published as an aid to the reader, but the publishers assume no responsibility for errors or omissions.

Aberthaw Company.....	166	Buhl Co.....	148	Edelen & Boyer Co.....	182
Acme Road Machinery Co.....	140	Bunting Hardware & Machy. Co.....	171	Eismann Magneto Corp.....	9
Aeroli Burner Co.....	148	Burnite Machy. Co.....	159	Engineering Products Co.....	138-102
Alabama Equipment Co.....	155	Bures-Clark Machy. Co.....	161	Engineers & Contr. Supply Co.....	190
Alamo Engine Co.....	130	Camp Co., C. F.....	181	Brickson Co., Inc., H. B.....	170
Alamo Iron Works.....	187	Cardwell Co., Inc., H. W.....	164	Erie Steam Shovel Co.....	7
Alban Tractor Co.....	166	Carr & Company, Ted.....	55	Ersted Mfg. Co.....	143
Aldrich Pump Co.....	148	Case, George D.....	175	Essick & Co.....	157
Alexander, Edgar.....	161	Casey & Co., Fred, W.....	178	Euclid Crane & Hoist Co.....	128
Alleghany Equip. Corp.....	183	Caterpillar Tractor Co.....	51	Everett & Co., R. B.....	187
American Cement Machine Co.....	138	Cement Block Machy. Co.....	150	Everhot Mfg. Co.....	134
American Hd'wre & Equip. Co.....	178	Cement-Gun Co.....	119	Feenaghty Machinery Co.....	181
American Inst. of Steel Constr.....	33	Central Foundry Co.....	113	Fickeisen-Finney Equip. Co.....	172
American Machy. & Supply Co.....	173	Coadwick Bros. Co.....	190	Fink Co., John W.....	159
American Saw Mill Machy. Co.....	150	Chain Belt Company.....	143	Fishback, D. E.....	161
American Steel & Wire Co.....	121	Chicago Automatic Conveyor Co.....	141	Fitzgerald, Paul.....	159
American Steam Pump Co.....	142	Choctaw Culvert & Machy. Co.....	185	Flory Mfg. Co., S.....	141
Anderson Tool & Supply Co.....	168	Cleveland Tractor Co.....	52	Flory, Lawrence V.....	172
Arizona Tractor & Equip. Co.....	156	Climax Engineering Co.....	159	French Co., A. W.....	138
Armstrong & Bros. Co., R. S.....	162	Clinton & Held.....	159	F-S Mfg. Co., Inc.....	129
Arnold Co., Inc., C. H.....	184	Clyde Co.....	165	Fuchs Equipment Co.....	173
Asaeville Supply & Fdy. Co.....	177	Clyde Equipment Co.....	181	Fuller & Sons Mfg. Co.....	150
Atlas Engineering Co.....	132	Clyde Iron Works Sales Co.....	19	Funkhouser Equipment Co.....	171
Austin Machy. Co., A. B.....	162	Coast Machinery Corp.....	157	Gad, Herbert.....	155
Austin-Western Road Machy. Co.....	135	Collins Kay Machinery Co.....	157	Galion Iron Works & Mfg. Co.....	141
Avery, O. B.....	172	Complete Machy. & Equip. Co.....	176	Gardner-Denver Co.....	154
Bacon Co., E. R.....	158	Conard & Bushy.....	151	Garfield & Company.....	158
Bacon Engineering Sales Co.....	179	Conboy Co., John A.....	182	Garlinghouse Bros.....	157
Bailey-Hall Machinery Co.....	189	Concrete Machy. & Supply Co.....	157	Gartner Co., F. W.....	187
Baker Mfg. Co.....	148	Concrete Surf. Machy. Co.....	136	Geijsbeek Engr. Co.....	188
Banks-Miller Supply Co.....	189	Connelly & Co.....	142	General Equipment Co.....	189
Barber Asphalt Co.....	196	Construction Machy. Co. of Cal.....	35	General Excavator Co.....	37
Barber-Greene Co.....	21	Continental Motors Corp.....	170	General Machinery Co.....	189
Barrett Co.....	103	Contractors Equipment Co.....	160	General Utilities Co.....	187
Barret, Thos. L.....	164	Contractors Equipment Co., Inc.....	168	General Wheelbarrow Co.....	36
Bartholow Co., J. W.....	186	Contractors Equipment Co.....	174	Gibbes Machy. Co.....	134
Bashford-McCord Corp.....	177	Contractors Sales Co.....	193	Gierke-Robinson Co.....	164
Bates Valve Bag Co.....	133	Cook Motor Company.....	159	Giles & Ransome.....	183
Bay City Dredge Works.....	195	Cornell Tractor Co.....	161	Globe Machy. & Supply Co.....	164
Beattie Machinery Sales Co.....	168	Coulter-Hart Equip. Co.....	159	Going Road Machy. Co., Inc.....	155
Becker, A. P.....	174	Cox & Company, A. H.....	188	Good Roads Machinery Co.....	48-49
Beckwith Machinery Co.....	183	Craven Co., E. F.....	178	Good Roads Supply Co.....	165
Benkart, H. W.....	175	Cunningham, Ortmyer Co.....	190	Graham Brothers.....	47
Blaw-Knox Co.....	142	Curd Equipment Co., Geo. B.....	178	Grier & Sons Co., R. D.....	166
Blystone Mfg. Co.....	121	Dallett Co., The.....	142	Green & Co., G. S.....	176
Boardman Co., The.....	191	D-A Lubricant Co., Inc.....	134	Hais Mfg. Co., Geo.....	140
Boeckh Machy. Co., Inc.....	190	Davis, Norris K.....	158	Hale & Co., Wm. H.....	170
Bond Co., The.....	167	Davis Engineering Co., C. B.....	155	Hall, Frank E.....	176
Borchert Ingersoll Co.....	171	Day & Maddock Co.....	179	Hardcock Wonder Drill Co.....	137
Borden & Remington Co.....	167	Dealers Equipment Co.....	162	Harris, R. L.....	135
Boston & Lockport Block Co.....	148	De Huff & Hopkins.....	182	Harron, Rickard & McCone Co.....	158
Boyer, James F.....	182	Dixon Crucible Co., J.....	136	Harvill Supply Co.....	186
Brandeis Machy. & Supply Co.....	164	Dixey, Inc.....	154	Hatcher Co., S. T.....	172
Breed Equipment Co.....	175	Dobbie Foundry & Machine Co.....	141	Havana Fruit Co.....	160
Brewster & Williams.....	166	Dodge, C. R.....	167	Haverstick & Co., Inc.....	177
Briggs-Weaver Machy. Co.....	186	Domestic Engine & Pump Co.....	117	Hedge & Matthis Co.....	167
Bright Sales Co., Inc., Graham.....	187	Dominion Equip. & Supply Co.....	191	Heil Co., The.....	143
Brinker Supply Company.....	184	Dopp & Co., J. W.....	168	Heltzel Steel Form & Iron Co.....	17
Brooks Co., R. E.....	176	Dow Chemical Co.....	126	Hercules Motors Corp.....	36
Brookville Locomotive Co.....	133	Dravo Equip. Co. 162-175-179-182-184.....	181	Herr, Henry R.....	127
Brown Bevis Co., Inc.....	191	Drott Tractor Co., E. A.....	190	Highway Trailer Co.....	137
Brown, Fraser & Co.....	196	Dyar Sales & Machy. Co.....	167	Hill, Nicholas S.....	151
Brown, Thos. M.....	166	Eagle Wagon Works.....	140	Hobbs, Inc., Lewter F.....	187
Brown & Sites Co.....	176	Earnest Bros.....	188	Hofius-Ferris Equipment Co.....	189
Browning-Ferris Machy. Co.....	186				
Buffalo-Springfield Roller Co.....	115				

(Continued on page 194)



# INDEX TO ADVERTISERS IN THIS ISSUE

(Continued from page 193)

Honhorst Co., Jos. ....	140	Moore, A. B., Jr. ....	162	Snare Corporation, Frederick. ....	151
Hoogendyk, F. Van Rossen. ....	2	Moore Equip. Co., H. W. ....	139	Solvay Sales Corp. ....	53
Hoppe, Geo. E. ....	188	Motor Power Equipment Co. ....	171	Southeast Supply Co. ....	162
Horter, J. Z. ....	160	Mueller Co., Geo. H. ....	190	Southern Machy. & Supply Co. ....	188
Hotel Benjamin Franklin. ....	144	Mullins Body & Tank Co. ....	190	Southern States Equipment Co. ....	165
Hotel Knickerbocker. ....	146	Mundy Sales Corp. ....	41	Speeder Machinery Co. ....	13
Howell, L. Z. ....	163	Mussens, Ltd. ....	191	Staley & Morris, Inc. ....	183
Hower, J. Shuman. ....	177	National Carbide Sales Corp. ....	143	Standard Machy. & Equip. Co. ....	185
Hubbard-Floyd Co., Inc. ....	176	National Machy. & Equip. Co. ....	188	Standard Oil Co. of Ind. ....	111
Huber Manufacturing Co. ....	125	National Supply Co., The. ....	180	Standard Oil Co. of N. Y. ....	150
Humphreys Mfg. Co. ....	126	Neely & Co., J. C. ....	178	Standard Power Equipment Co. ....	156
Hunt Road Machy. Co., Jeff. ....	185	Neptune Meter Co. ....	149	Standard Scale & Supply Corp. ....	23
Hunter Machy. Co. ....	169	Newark Concrete Pipe Co. ....	138	Stanley & Gill Machinery Co. ....	160
Hyland Co., K. H. ....	163	New England Implement Co. ....	168	Star Drilling Machine Co. ....	144
Inaley Manufacturing Co. ....	40	Nixon-Hasselle Co. ....	185	Steinbarger Co., H. N. ....	159
Interstate Machy. & Supply Co. ....	174	Noble Co., K. B. ....	160	Sterling Wheelbarrow Co. ....	38
Jaeger Machine Co. ....	193	Northern Conveyor & Mfg. Co. ....	148	Stith Co., C. L. ....	180
Johns Equipment Co., E. W. ....	163	Northwest Equip. Co., Inc. ....	173	Stover Mfg. & Engine Co. ....	140
Johnson & Deslman, Inc. ....	156	Norton Co., J. B. ....	177	Sullivan Machinery Co. ....	128
Johnson Bros., Inc. ....	137	Novo Engine Co. ....	130	Superior Supply Co. ....	163
Jones Co., C. H. ....	187	O'Brien Co., Inc., Martin J. ....	184	Sutton-Osborne Supply Co. ....	178
J-T Tractor Co. ....	132	Ogden, M. B. ....	161	Templeton, Kenly & Co., Ltd. ....	134
Kelley Co., E. B. ....	176	O'Neal Tool & Supply Co. ....	169	Thew Shovel Co. ....	58
Kellogg-Burlingame Co. ....	169	O. K. Clutch & Machy. Co. ....	148	Toledo Sales & Engine Co. ....	180
Kenney, G. C. ....	172	Olsen, Ole K. ....	165	Toledo Wheelbarrow Co. ....	150
Keystone Driller Co. ....	43	Orton Crane and Shovel Co. ....	11	Trackson Company. ....	45
Kiesler Co., Jos. F. ....	144	Pacific Flush-Tank Co. ....	191	Trackson Full-Crawler Co. ....	182
Kinney Mfg. Co. ....	123	Pacific Hoist & Derrick Co. ....	188	Track-IT Company. ....	125
Kinney Standards, Inc. ....	150	Patterson Co., Inc., C. T. ....	165	Trevor Co., H. B. N. ....	175
Knox Engineering & Equip. Co. ....	163	Pattison Supply Co., W. M. ....	179	Trucon Steel Co. ....	5
Koehring & Co. ....	31-34	Peden Equipment Co. ....	179	Tulley Equipment Co. ....	173
Kuhlman Co., W. A. ....	131-180	Pegg, E. F. ....	179	Turner Supply Co. ....	156
Lake Co., F. D. ....	169	Penn Machy. Co., Inc., H. O. ....	176	Turner, John D. ....	156
Lakewood Engr. Co. ....	46	Penna.-Dixie Cement Corp. ....	115	Tyler Co., M. B. ....	168
La Lance Equipment Co. ....	189	Perkins Co., P. I. ....	167	Union Iron Works. ....	150
La Plant-Choate Mfg. Co. ....	50	Perry & Wilson Equip. Co. ....	164	Union Water Meter Co. ....	148
Lane Equipment Co., T. J. ....	180	Phillips Tractor Co., G. C. ....	155	Universal Hoisting Machy. Corp. ....	140
Latture Equipment Co., J. L. ....	181	Phillips & West, Inc. ....	174	Universal Power Shovel Co. ....	128
Lauson Mfg. Co., John. ....	131	Phinney, Frank B. ....	167	Upper Peninsula Tractor Co. ....	170
Lawrence-Goodling Co., Inc. ....	15	Pidgeon-Thomas Iron Co. ....	186	Uriarte, Joaquin M. de Ingeniero ....	191
Le Roi Company. ....	15	Pioneer Tractors, Inc. ....	136	U. S. Cast Iron Pipe & Fdy. Co. ....	109-147
Lexington Mine & Mill Sup. Co. ....	164	Pittsburgh Machy. & Equip. Co. ....	184	Van Dorn Iron Works Co. ....	139
Lincoln Equip. & Materials Co. ....	172	Pittsburgh Testing Laboratory. ....	154	Van Keppel, G. W. ....	172
Lindrooth, Shubart & Co. ....	159	Pope Equipment Co. ....	179	Van Keppel & Co., J. R. ....	180
Link-Belt Co. ....	42	Porter Supply Co. ....	189	Van Name, Eugene F. ....	175
Littleford Bros. ....	146	Potts, Jr., & Company, J. ....	188	Wallace & Tiernan Co., Inc. ....	145
Llewellyn Inc., L. D. ....	161	Power Equipment Co. ....	164	Wallace Equipment Co. ....	169
Lockett & Co., A. M. ....	165	Queen City Supply Co. ....	178	Ward Co., Lee T. ....	183
Loggers and Contractors Machy. Co. ....	181	Rabbitt, C. F. ....	173	Waterhouse, Clifford. ....	171
London Concrete Machy. Co., Ltd. ....	191	Railsback, Leigh M. ....	157	Waterman Corp. ....	128
Lower Co., W. B. ....	163	Ransome Concrete Machy. Co. ....	105	Weber Implement & Auto. Co. ....	173
Louis, John C. ....	166	Raymer Hardware Co. ....	171	Waukesha Motor Co. ....	107
Louisiana Rd. Machy. Co. ....	165	Republic Iron Works. ....	144	Wemlinger, Inc. ....	154
Low-Peters Equip. Co. ....	163	Riddell Co., W. A. ....	136	Western Block Co. ....	143
Lyons Machinery Co., Inc. ....	156	Rogers & Co., P. L. ....	132	Western Contractors Supply Co. ....	163
McClelland, R. T. ....	158	Rogers Bros. Corp. ....	123	Western Material Co. ....	185
McCracken-Ripley Co. ....	181	Rome Mfg. Company. ....	117	Western Supply Co. ....	173
McDonald & Burgen. ....	160	Rosalt Co., T. W. ....	170	West, Payne G. ....	169
McKiernan-Terry Drill Co. ....	25	Rossiter Co., Edgar A. ....	151	West Virginia Mine Supply Co. ....	189
Mack Trucks, Inc. ....	175	Ruane Machinery Co. ....	184	Wettlaufer Bros. ....	169
Malvese & Company, Geo. ....	129	Russell Engineering Co. ....	151	Whayne Supply Co., R. C. ....	165
Mamer Company, The. ....	168	Russell Grader Mfg. Co. ....	138	Wheeler Murray Co. ....	175
Marion Steel Body Co. ....	130	Safety Gas Main Stopper Co. ....	144	Whitcomb Co., Geo. D. ....	119
Martin Machinery Co., E. A. ....	171	Sampson Co., Geo. H. ....	167	Wilkins, J. D. ....	178
May, Inc., W. B. ....	175	Sasgen Derrick Co. ....	142	Willamette Iron & Steel Works. ....	138
Mead-Morrison Mfg. Co. ....	127	Sauerman Bros. ....	150	Williams Co., W. W. ....	180
Meadows, Inc., W. R. ....	134	Schaefer Wagon Wks., Gustav. ....	130	Williams Nat'l Form Clamp Co. ....	144
Melli-Blumberg Co. ....	166	Schilling Co., I. E. ....	161	Williamsport Wire Rope Co. ....	29
Meyer Co., Henry H. ....	166	Seabrook Co., Inc., C. F. ....	174-177	Wilson, J. Walker. ....	181
Miami Trailer-Scraper Co. ....	143	Seibert-McNeilly Machy. Co. ....	189	Wilson Machinery Co. ....	160
Michigan Equipment Co. ....	170	Service Equipment Co. ....	183	Wilson Tank & Culvert Co. ....	186
Michigan Highway Equip. Co. ....	170	Service Supply Co. ....	183	Wilson-Weesner Wilkinson Co. ....	186
Milburn Co., Alex. ....	154	Shannon & Co., Jacob J. ....	183	Witte Engine Works. ....	132
Milburn Machy. Co. ....	179	Sheehan & Co. ....	187	Wolverine Concrete Machy. Co. ....	169
Miller Equipment Co. ....	177	Shepherd-Crook, Inc. ....	157	Wood Hydraulic Hoist & Body Co. ....	135
Mills & Lupton Supply Co. ....	179	Shreveport Machy. & Sales Corp. ....	166	Woodward, Wight & Co., Ltd. ....	165
Minneapolis Equipment Co. ....	170	Slade Brothers. ....	174	Wormington & Powers, Inc. ....	166
Minnesota Equipment Co. ....	170	Smith-Booth-Ushe. Co. ....	158	Yancey Bros. ....	162
Mitchell, Lewis & Staver Co. ....	182	Smith & Co., Geo. F. ....	173	Yancey Tractor Co. ....	161
Monarch Equipment Co. ....	172	Smith Co., T. L. ....	39	Young & Van Supply Co., The. ....	156
Moady, M. D. ....	160	Smith Engineering Works. ....	101	Ziegler & Co., Inc., Wm. H. ....	171
		Smith-Meadows Supply Co. ....	155	Ziegler Machy. Co., Geo. W. ....	184
		Smith Co., Stuart S. ....	158		

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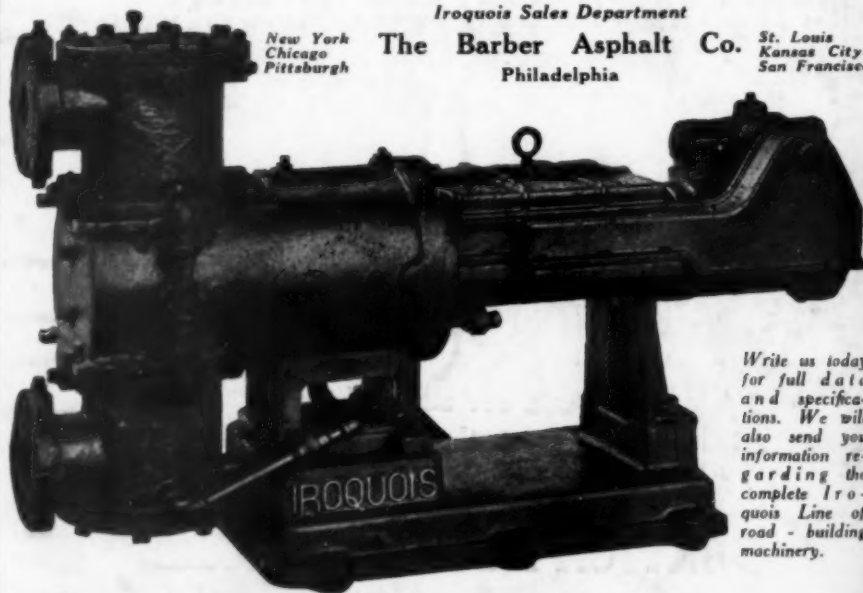
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